RICE UNIVERSITY

Arms Racing and Conflict in The Third World: 1970-2000

by

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A THESIS SUBMITTED
IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE

Doctor of Philosophy

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DECEMBER 2009

ABSTRACT

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In this dissertation I investigate the relationship between arms races and the probability of militarized conflict onset. The research question is critically important on at least two fronts: first, many policy makers and scholars alike believe ramping up military forces is the best way to deter military conflict (the peace through strength argument) while others suggest arms races do nothing but lead states towards militarized conflict. Second, this dissertation fills a research gap present since the end of the Cold War since research on arms races by the scientific community of conflict scholars has slowed dramatically since the end of the Cold War and findings remain inconclusive. The Steps to War research program (Vasquez, 1993; Senese and Vasquez, 2008), however, suggests arms races are one of the central provocateurs of militarized conflict and warfare between states. Using this theoretical approach I frame arms races as dangerous events in the global arena and provide a clear theoretical account of the international system, the incentives for arming, and the linkage between arms racing and international conflict. The central theoretical argument suggests arms races lead states into conflict with one another. I test my expectations through a regional analysis of minor powers from three geographic areas: Latin America, Africa, and the Middle East over the period 1970-2000. In an important departure from the majority of previous quantitative arms race and conflict studies I utilize the actual weapons stockpiles of states (as opposed to defense expenditure data) as the primary measure of an arms race. The empirical results not only shed insight into the likelihood observing international conflict when preceded by arms racing but also indicate whether certain types of arms racing – air as opposed to sea or ground racing, for example – may be more likely to develop into conflict than other forms.

Acknowledgements

Completion of a doctoral dissertation signifies the end of one of the most wondrous and horrific experiences a person can have. Though I will not miss the emotional terror my dissertation wrought upon me daily, I can say without hesitation I have become a better person in every dimension; for this alone, I am forever grateful. Thus, since I do not plan on writing another dissertation my acknowledgements will be exhaustive and complete. This means that although I probably would not be dead, I certainly would not have completed graduate school without each of the following people, places, and things I acknowledge in the following pages.

IR Folks

First, I must thank my dissertation advisor Ric Stoll: "All gave some, some gave all". I may never tell anyone how many versions of my dissertation you read through while providing crucial comments and suggestions for improvement. Regardless, I cannot thank you enough for sticking by me and giving me the support and motivation to see my project through to completion. Above all, I want to thank you for showing me through both your work and your evaluations of my own how to do political science 'the

right way'. Your substantive and technical grasp of political science helped me as a scholar while your encouragement and faith in me benefitted me as a person. I now release you from advisor purgatory. Thank you for everything, Dr. Stoll.

I would like to thank Cliff Morgan for providing me with at least one near death experience. Beyond that I do wish to thank you for caring enough about me to help me improve my dissertation, painful as it sometimes was. Thank you for helping me identify and correct sections – sometimes even complete chapters – that were "stupid". Lastly, thank you for never hesitating to discuss with me the various intangibles – factors beyond just research – that often directly affect how to be a successful political scientist.

I would like to thank Bill Reed for being an important part of my development at Rice. Since all but one of my international relations courses were taught by you I sometimes joked I was getting a 'Ph.D. in Bill Reed'. Either way, the material you covered in your courses provided a great knowledge base of cutting edge international relations research and also prepared me to handle prelims without a hiccup. Most importantly, thank you for a few well placed words of encouragement during my second year that made all the difference.

I want to thank Ashley Leeds. Although not an official member of my committee, you have been in every sense of the word a role model for me in my time at Rice. It would be difficult for me to imagine a person who exhibits the same level of professionalism and dedication to research and teaching as do you. Thank you for always having your door open to me and thank you for helping me broaden my view of

international relations to critically important topics beyond just bombs and tanks.

I must thank Brandon Valeriano. From my first TA at Vanderbilt, to a best friend, and now co-author your advice and support have been instrumental in my progress over these years. Though it has often been a rather unorthodox mentor-mentee dynamic I have enjoyed your suggestions and help with all things professional and personal. I look forward to terrorizing future conference hotels with you.

My interest in international relations started innocently enough at Vanderbilt University after my first American Foreign Policy course with Jim Ray. So, in retrospect, I suppose this is all his fault. I want to thank him, nonetheless. My first conflict course was taught by John Vasquez who I realize now has a lot to say about the subject. I want to thank him for continuing to offer me advice and feedback on my own research. I would also like to thank Paul Diehl for graciously agreeing to read an early draft of my dissertation prospectus and offering comments and suggestions I will continue to revisit. I also thank Sara Mitchell for her friendship and for a fun sabbatical semester spent at Rice in 2009.

Last in this section, I must thank each and every one of the Rice undergraduate students I have had the privilege of teaching (and learning from). I have never encountered undergraduates as frighteningly eager to learn as are Rice students. It is wholly abnormal, for sure, but your intellectual curiosity and passion consistently provided me with some of the happiest and most personally rewarding experiences in graduate school. I wish you all the best and encourage you to – at least occasionally – skip the readings and slack off; you will still graduate, I promise.

Friends at Large

There is a select group of people that have had an important impact on me professionally and personally through avenues beyond a shared interest in international relations research. First, I thank Lanny Martin and Randy Stevenson. Your scholarship and intellectual acumen is surpassed only by your friendship. I thank you both for helping me galvanize some very personal preferences – sometimes through rather shocking experiences – that I did not know needed galvanizing. Although entirely unnecessary, it was without exception always fun. Thank you both for being true friends. I would also like to thank Mark Jones for his generous support and advice throughout my graduate studies. Mark knows more about Latin American politics than anyone ever or yet to be born and I have benefitted tremendously from his wealth of knowledge.

I thank Jerry Rusk for some great times at The Davenport and for his sage advice and colorful stories. My thanks go to Keith Hamm for his generosity of advice, to John Ambler for his encouragement and helpful discussions about undergraduate teaching, and to Gina Branton for her friendship and encouragement during my time at Rice. I want to thank Ann Mikus for always providing a smile and enjoyable conversation as I often wandered the hallways in search of meaning. I thank Beth Franks for her help and diligence in dealing with my travel reimbursements and application materials.

Since matriculating at Rice I have made some truly wonderful friends. I want to thank David Goodman: even though your sports interests (hockey) and research area (state legislatures) were diametrically opposed to my own you have been and continue

to be a great friend (along with Claire). I guess all I really need to say is: "Somebody do something!" A special Commodore thanks goes out to Raul Gonzalez: BLACK! GOLD! WHO YA WIT? VU!! I want to thank Carlos Cuellar for chingas of good times: "Might as well". Next, my classmate, office mate, and unofficial Argentinean mascot, Juan Pablo. Juan, you are the absolute gold standard for jingoism. My only regret is that all future instances of jingoistic behavior will pale (and therefore bore) in comparison. Either way, it was consistently entertaining and I do thank you for your friendship as we progressed through each hurdle at Rice. I want to also thank David Fortunato (Smiff), a late comer to the game, but a good friend to me, nonetheless. Thanks for sharing some good times with me in my last couple of years at Rice. May the rest of your time here be as rewarding as was mine.

I want to thank some of my elders, students who were well on their way to graduation when I was only starting my journey. Valentin Krustev and Greg Vonnahme are good friends to me who never hesitated to help me when I needed some research advice or insight. I thank Beth Miller and Michaela Mattes for being fun office mates and friends and providing me with a template for work ethic during my first couple of years. I would also like to thank Craig, Andrew, Daina, Dan, Yoshi, Jesse, Toby, Carla, Aki, Stephanie, and Tiffany for being good friends and colleagues during my time here. I wish you all the best of luck as you continue your own maddening journeys through Rice. I also thank AP for some entertaining years at Morningside Square Apartments.

Old School Friends

I want to extend a very heartfelt thanks to the Shaffer Family: Al, Katie, and little Hailey. From the bottom of my heart, thank you all for being such good friends to me and allowing me to be a part of your family here in Houston. Al, your silent courage has been an important source of inspiration for me; thanks for your wonderful friendship and countless nights of 'Brooklyn!' and Schlitz. You guys are the best and I look forward to continuing to be Uncle Victor for little Hailey.

To my Vanderbilt friends: I thank Adrian Gale for simply 'saving my life' one night in London, summer of 2002, soon after we had just met; another hour and I might have drowned. I want to thank Dave Epstein, a great friend and now my personal dentist. Thanks for lots of great times in the Bronx. I thank Chad Graham for his friendship and unique style of personal communication. I want to thank Alan Loprete and Bharath Subramanian who were two of my college freshman hall mates for their continued friendship. I want to thank Stedman (and Banecker) for some fun times in New Orleans ('Mardi Graaaas!').

I continue to be graced with several friendships that have endured at least since high school, if not elementary school. I want to thank John Cacioppo for lots of great weekends in Lake in the Woods and continuing to be an important friend to me and winning a bet no one thought could be won. I thank Ramesh Nagarajan for a great 'rivalry' throughout high school, a preposterous summer at SSTP, for your wonderful friendship, and for 'losing' the same ridiculous bet. I want to thank Ryan Rexroth ('Rexworth' and 'Duckworth') for a truly awesome friendship and for hours of useless

conversation that has added up to lots of wonderful memories. I guess I thank Cara, too, though I'm not sure exactly for what.

Potpourri

At this point I want to take some time to acknowledge and thank the various people, places, and things that either prepared me or helped me complete my graduate studies at Rice. I would first like to thank booze. Whether from a wine glass or paper bag, it never stood me up or let me down. I look forward to continuing this relationship. I want to thank Vanderbilt University (and the city of Nashville) which is without exception the finest university on the planet. It was the perfect college experience that taught me as much about my own beliefs and values as it did about science and the world. I also should thank the Hernando County public school system. If given enough time, I can remember every teacher I have learned from since first grade. This is a testament to the impact they all had upon me and I gladly attribute my successes to their hard work, dedication, and kindness. Thank you all for sharing with me the beauty of learning.

Since I neither hunt nor gather, I relied upon a very narrow source of nourishment during my graduate studies. I want to thank Jason's Deli for the hundreds of pounds of ham and provolone subs I consumed over the years nearly every day between the hours of 4 and 5pm after class. I would like to thank Mi Luna Spanish Tapas restaurant for some exquisite chicken saffron kabobs and paella and for being the source of several misguided conversations with taxi cab drivers who misunderstood the

word 'Tapas'. Lastly, I owe thanks and a debt of gratitude to the Domino's Pizza store on Kirby Drive: I want to thank the staff for tolerating (and often granting) my hostile late night demands for 'the Rice special!!!' when, in fact, no Rice special existed.

I want to give a special thanks to James Taylor, Jimmy Buffett, and The Eagles. Being the middle-aged baby boomer that I am the music from these three artists has continued to provide the absolute perfect soundtrack to my life. No other music matters much to me. I would also like to thank the Houston chapter BMWCCA for providing a healthy outlet to relieve stress and meet new friends with similar passions.

Family

One hundred percent of the hard work and sacrifice it took to reach this point in my life was done long before I ever stepped foot on campus at Rice: I have simply been the conduit for an enormous amount of love, devotion, and personal sacrifice by my family. I am hesitant to take any credit at all for whatever successes I have had at this point in my life and instead I want to acknowledge my family and the immeasurable role they have had in shaping me as a person.

First, I want to thank my 'new' family, Larry, Sue, Shannon, and Kyle. Blu Ray players, margaritas, and public housing in the garage apartment: Larry and Sue, you guys are criminally cool. I have cherished your love and kindness from day one and consider myself fortunate beyond belief. I would walk through fire for Jamie, but you guys make it too easy. Thank you all for everything. I want to thank my new sister Shannon, an OB/GYN, and new brother Kyle, a surgical pathologist, for ending my 28

years of only child-ness. I'll know something has gone terribly wrong should I ever need either of your medical expertise. I also want to thank the entire Hardy and Rafferty families for my baptism by fire over the past couple of years: the fun has been outweighed only by the love.

I want to thank my dad, Edgar. I want to thank you for loving me more than I thought possible. Thank you for passing down to me your passion for knowledge and reason. Your work in the public sphere has shown me that motivated and intellectually driven people can have a direct – and positive – affect on policy and people. Though many of my happiest memories growing up involved outdoor adventures in which you incurred some physical harm my happiest memories during graduate school involved late night dinner conversations about politics and life. Dad, thank you for always believing in me; I love you dearly.

I want to thank Owen. Owen, thank you for being such an active and interested person in my life. You have expanded my horizons in ways I am still discovering and have been an indelible source of motivation and encouragement. I have enjoyed watching countless servers fail to pour you a proper cocktail but most of all I have enjoyed our conversations about politics and policies over nearly 20 years. Thank you for always demanding both an opinion and an explanation from me – it was excellent preparation. I also want to thank my Grandmother Frida for her unbelievable love, my Uncle Amado and Aunt Maura, my Uncle Will for pizza and football growing up, and my Aunt Etta and Uncle David for visits to their swimming pool. I love you all.

I want to thank my mom, Donna. Mom, what an improbable yet inevitable

journey this has been. Thank you for loving me more than life itself and showing me the most important thing in life is to spread joy, love, and hope to others whenever humanly possible. I also want to thank you for always treating me as an equal and for periodically reminding me that to whom much is given, much is expected. Your love and flawless guidance have made me the best man I can be. In the end, you didn't raise an idiot or an a$$hole and what a truly remarkable accomplishment that is. I love you always.

I want to thank my wife and partner for life, Jamie. I came to Texas for a degree and wound up with a blessing. Although this particular blessing happened to drive a Prius (which I had simply assumed were illegal in Texas), there was never any doubt from day one. Jamie, you have challenged and loved me like no other. Most people spend a lifetime looking for truth and purpose yet you have given me both; how can I ever thank you for this? You are the best in every sense of the word and I live each day knowing that with you right next to me I can now do anything. Above all, thank you for letting me be me and loving me, nonetheless. I love you with all of my being.

Dedicated To

This dissertation is lovingly dedicated to my grandparents, Claude ('Papaw') and Geneva ('Nanny') Ricketts. I want to thank my grandfather, Claude Ricketts, a proud alumnus of the Greatest Generation. Though a veteran of war he taught me that a real man can use words and compromise to diffuse conflict with others. Most importantly, my grandfather only ever judged others by the content of their character. He also

taught me that people always deserve at least a second chance. Daily dinner table conversations about politics with my grandfather showed me the importance of being informed and are probably most responsible for my love of politics. Lastly, I am proud to have learned the technique of "Let me speak to your manager" from my grandfather, a true master; it has paid impressive dividends in countless customer service interactions. Papaw, I miss you every day.

Lastly, I want to thank my grandmother, Geneva Ricketts. My grandmother was witty and charming, a dangerous combination on most days. She taught me to have a healthy skepticism of people and situations that has served me well in life. She was above all, however, a loving and self-sacrificing woman who never hesitated to slip me some cash so I could have a good time with friends or enjoy a weekend trip. Spending time with her on weekends watching The Golden Girls are irreplaceable memories I keep with me to this day. I will miss her Sunday dinners, her smile, and her gentle hugs. Nanny, I love and miss you.

Somewhere in Texas — Victor C. Marin

November, 2009

Contents

List of Tables

List of Figures

Chapter 1

An Introduction to the Ongoing Problem

1.1 Introduction

Weapons fuel war. When bargaining, negotiations, diplomacy and coercion finally break down interstate conflict is prosecuted successfully or unsuccessfully by the weapons each state has accumulated over time. As the endeavor of international relations and international conflict scholarship has shown, war is a dynamic and complex event. The factors leading to interstate conflict are many and the literature has produced a compelling set of theoretical approaches and empirical findings. Considerations regarding the influence of factors such as power, alliances, deterrence strategies, and domestic politics – to name just several topics – have all provided a richer understanding of the outbreak and process of international conflict.

Yet, given a host of conditions that may or may not precipitate international warfare weapons themselves remain one of the few *necessary conditions for the existence of international conflict.* With this simple fact in mind I seek to examine theoretically and evaluate empirically the relationship between arms racing and

international conflict. That is, can arms racing between states reasonably predict incidents of international conflict?

1.2 The Anthropology of Arms

Arms racing is most often discussed and examined in the context of political science or history. From an anthropological perspective, however, the pursuit of weaponry and strength through arms has been a very real part of the development of mankind. Evolutionary anthropologist Richard Wrangham (1999) is explicit: "Warfare has traditionally been considered unique to humans. It has, therefore, often been explained as deriving from features that are unique to humans, such as the *possession of weapons* [emphasis added] or the adoption of a patriarchal ideology" (1).[1] So from the earliest of times we know man sought to arm himself whether for hunting, personal defense, or survival.

Indeed, a swath of anthropological research has focused upon the creation and use of various 'weapons systems' by primitive man and early hominids. Raymond Dart (1959) investigated some of the earliest evidence of man-made weapons: the sharpened bones of large game animals. His research sought to understand how "...primitive sapient man at Kalkbank 15,000 years ago and the still more primitive protoman *Australopithecus prometheus* about 1,000,000 years ago at Makapansgat obtained these spiral blades" (91). Using the archaeological evidence of antelope femurs that had been sharpened into weapons he concluded "...that a simple, but intelligence-demanding

[1] To be clear, the Wrangham piece actually seeks to determine whether a specific form of warfare – coalitionary killing – is present in other species such as chimpanzees.

technique of making spiral blades and stabbing tools from humeri or femora had been invented by *Australopithecus* and was being carried on nearly a million years later by Kalkbank man" (91).

Naturally, mankind advanced and so too did weapons technology. Stiner (1993) notes "Upper Palaeolithic and Late Stone Age assemblages of Eurasia and Africa...seem to be full of projectile weapons, along with shaft straighteners, wrenches, or throwing boards" (70). In "The Origins of Weapon Systems" (1994) Malcolm Farmer discusses the anthropological importance of understanding the implementation of the bow and arrow and throwing dart weapons used by early man since each represented a significant advancement in weapons technology.

In a related piece on prehistoric man's hunting proclivities, Peterson (1998) highlighted the rational nature of prehistoric man's decisions to use various weapons depending on the prey. She concludes that "Technological change in hunting weapons clearly should not be viewed as a by-product of a unilinear evolutionary scheme: from spear...to atlatl...to bow and arrow. It is perhaps more realistic to view weapon system diversity as enabling hunters to choose among tools appropriate for season, game species, topography, environmental situation (land vs. water), and milieux (single vs. communal hunt) (386).

A recent string of anthropology research has focused on the role weapons may have played in determining the fates of Neanderthals and early man. One of the most critical topics in paleoanthropology notes Shea (2001) is the extent to which Neanderthals and early man may have coexisted. He says current research shows

"Neanderthals and early modern humans now appear to have been contemporaries, possibly different species, who competed with each other for the same niche in West Eurasian environments" but that "Only modern humans emerged from the Middle Paleolithic successfully" (38). A possible answer supported by recent archaeological evidence from Shea (2007) and Churchill and Rhodes (2007) is that Neanderthals, while utilizing relatively advanced weapons, failed to develop the projectile weapons used by early modern man, most notably projectile spears and the bow and arrow system. Their evidence therefore suggests a *superior form of weaponry* employed by early man likely had a non-trivial impact on the extinction of Neanderthals.

Although only a small sampling of anthropological and archaeological research the works discussed above provide compelling insight into the utility of weapons for survival and violence against others. In summary, at least part of the anthropological enterprise suggests weapons have been an *indispensable* part of human social evolution. So although such early uses of weapons may not be directly comparable to their use in modern day arms racing, what remains distinctly true is that weapons then and now represent an ability to meaningfully influence the world around someone. That is to say then, just as now, weapons provide powerful leverage.

Thus, the pursuit and use of weapons has in many ways permeated the human experience to this very day. As such, the scientific study of arms racing and international conflict becomes very much a study of the human condition. Why do states arm? How do they arm? What are the consequences of increased levels of arming? Although I will consider these and other related questions in the context of

political science, recognizing that the phenomenon of arming and arms racing is at least as cultural and anthropologically motivated as it is political legitimizes the research question from the very outset; arms racing is not a fad, it is not random, and it is most certainly not an artifact of twentieth century super power interactions. These reasons alone make the study of arms racing indispensable to our collective understanding of international relations and, more specifically, international conflict.

Hence, this is a dissertation about the relationship between arms racing and interstate conflict. The theoretical argument I lay out suggests arms races increase the chance for militarized conflict between states; to test this hypothesis I analyze the minor powers of the international system from 1970 to 2000 located in three important regions: the Middle East, Africa, and Latin America. I pursue two broad goals in this research: first, the scholarly tradition linking arms racing to the onset of international conflict continues to lack any clear consensus; theoretical and empirical progress has been somewhat sporadic and so whether and how arms racing between a pair of states affects the likelihood of experiencing international conflict remains ripe for additional research. A recent piece by Gibler et al. (2005) argues similarly in their claim that "...little conclusive social science evidence exists as to whether arms races deter, escalate, or are spurious to conflict" (1).

Second, the overwhelming majority of prior arms race and conflict studies focused on the major powers of the system[2] with a preponderance of the Third World failing to receive much scholarly attention. As a result, the end of the Cold War (while a

[2] Mullins (1987), however, did produce a quantitative study of militarization and economic development which analyzed a set of 48 minor power African states.

global public good) stymied future research on arms racing and conflict for both major and minor powers. As such, I shift the focus away from the handful of major powers in the system and instead investigate the relationship between arms racing and conflict amongst the nearly 100 minor powers that comprise the Middle East, Africa, and Latin American regions of the international system.

I therefore proceed by recognizing the need for theoretical and empirical progress in the scholarly literature as well as the importance of developing a more stringent conceptual model of an arms race and using this model to investigate the relationship between arms racing and international conflict. Portions of this research will therefore center upon a crucial presentation and explanation of the arms race model I develop and utilize in this dissertation. Although I present my model of arms racing as an important contribution from this research I note here and later that ultimately this research is about explaining the onset of international conflict. To do so, however, requires a clear conception of *how and why arms racing begins* as well as an accurate definition and model of arms racing in order to establish a defensible empirical relationship between arms racing and conflict.

1.3 Defining and Discussing Arms Racing

It is prudent to offer here the definition of arms racing to be used throughout this dissertation as well as a brief discussion of how arms racing has been involved in recent international interactions. This is because popular conceptions of arms racing seem to misinterpret when and how an arms race actually begins. Countless cable news

channels often erroneously report the outbreak of an arms race or perhaps a potential arms race about to develop between some countries or region: "The general media now tends to equate it [arms racing] with any substantive development, progress, or buildup in weapons acquisition, but *it takes two to compete* [emphasis added]" (Tertrais, 2001: 123). Additionally, a real arms race also takes both time and contention over issues to develop. They do not spring up rapidly and do not appear suddenly when some state just happens to disagree with the policy of another.

Thus, the underlying theme of my research as alluded to above is real arms racing occurs only with sufficient time and reasonable motive. A definition of arms racing as it will be used throughout my investigation should help clarify much of what will follow:

> **Definition**: an *arms race* is a bilateral (dyadic) interaction in which both states consciously and observably increase their level of weapons stockpiles over an extended period of time against one another due to some underlying animosity over an issue/s. An *arms race* therefore involves reciprocal motive, increased arming, and time.[3]

[3] In an expansive essay on arms racing, Colin Gray (1971) presented a similar definition of arms racing in an effort to capture the contentious and interactive nature of the phenomenon. He defined arms racing to be "Two or more parties perceiving themselves to be in an adversary relationship, who are increasing or improving their armaments at a rapid rate and restructuring their respective military postures with a general attention to the past, current, and anticipated military and political behavior of the other parties" (40). Schelling and Halperin (1961) offer the following definition: "'Arms Race' refers to the interaction between two or more adversaries' military programs, to a tendency for each side's program to respond to what the other is doing. The arms level that each is willing to support depends on the level the other side has reached" (34).

This was certainly the case with the most well cited arms race to date, that between the United States and Soviet Union.[4] A span of nearly fifty years and the quest for global hegemony fueled what eventually became a massive nuclear arms race between the two powers. The traditional focus on the Cold War arms race is just but one example of the larger pattern of scholarly attention that has been paid primarily to the major power states of the international system with much of the relevant literature oriented towards understanding arms racing in the context of the most powerful/important states in the system. Temporally, this has meant a particular focus on the racing that occurred amongst the European powers of the nineteenth century (mostly naval racing) as well as before and during the interwar period of the two World Wars and subsequent Cold War arms race of the twentieth century.

Yet, in the context of the massive arms race, the Cold War passed rather unceremoniously. Today the Western European powers are at peace with each other, Russia and the United States have enjoyed normalized diplomatic relations and regular state visits since the dissolution, and China seems to understand that its continued economic success is intimately tied to future trade with the United States as well as reasonable periodic political concessions. This is not to suggest relations between the major powers are in perfect harmony; in the summer of 2007 Russian President Vladimir Putin accused the United States of instigating a "new round of the arms race" through the development of a missile defense shield (Shchedrov, 2007).

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[4] Some argue arms races (including that between the Soviet Union and the United States) may be the product of internal forces (such as bureaucratic momentum). I touch upon this notion in the literature review chapter that follows.

Indeed, old habits die hard; even with the shared experience of the Cold War, the overall trend towards democratization, and the potential for significant economic losses it would be foolish to blindly assume that no serious arms competition can or will ever spring up again between the major powers of the international system. However, major powers such as Russia, China, and the United States are the 'celebrities' of the international system, so to speak; even the most mundane of actions by such states receive close scrutiny and analysis. In this regard, military buildups and diplomatic deterioration between a pair of major powers will likely be at the very least documented from the outset so that appropriate pacifying measures and solutions can be developed quickly. It is not clear the beginnings of a potential arms race between a pair of minor states would receive such important early intervention.

1.4 Why Minor Powers?

It is true the majority of the scientific literature on arming and conflict has dealt with the major powers of the international system and understandably so. The past two hundred years of international relations have been undeniably shaped by the actions of major power states such as Prussia and Germany, Great Britain, France, Russia, and the United States especially during the twentieth century. Many analysts believe the international landscape of the future will be determined in large part by the actions of the United States and rising China. Indeed the pursuit of military superiority and the use of these weapons in the conflicts and wars between the major powers have affected billions of people throughout the world.

Yet, the importance of major powers in international relations in no way diminishes the role minor powers have played and continue to play in the international system. Small states have also sought to survive and influence their surroundings by building up military forces and waging conflict against others. Thus, an updated approach to the study of arms racing and international conflict should perhaps focus upon the minor powers of the international system. The forces of globalization have indeed made the world much smaller and minor powers now play a more important role in the stability of the international system: "...there can be no guarantee that a crisis in one of the world's micro-states will be containable, either locally or regionally. The threat to our stability is mutual, whether we be citizens of the small territory at the centre of the crisis or of a larger nation which finds itself drawn in" (Harden 1985: 1). My research therefore investigates whether the arming patterns of *minor powers* support the theoretical expectations presented later in this chapter: do minor power states engage in arms buildups and are these dyadic competitions associated with the onset of interstate conflict?

Some would argue minor states have always been important players in the global arena but such claims are less evident when the traditional international relations scholarship is reviewed. Power Transition Theory, hegemonic stability, and the realist paradigm are all theoretical approaches and research agendas explicitly concerned with the consequences of major power interactions. Even Immanuel Wallerstein's (1979) World Systems framework conceptualized the globe as a three tiered system in which the Core (rich, powerful, industrialized nations) was supported and perpetuated by the

subservient Semi-Periphery and Periphery states. Although Semi-Periphery states might have some chance of economic development and ascension the majority of states would be confined to the rather inconsequential Periphery.

Fortunately, there is some evidence to suggest the conventional wisdom may be shifting. Lemke's (2002) *Regions of War and Peace* partially inspires my approach because it adopts the traditionally major power oriented Power Transition Theory and applies it to a regionally based, minor power focused study of international conflict. He echoes the concern above regarding the importance of minor powers and notes:

> "We might be asked whether the Third World matters. This question is normatively offensive. Of course the Third World matters. Most of humanity lives in the Third World...mankind's ancient civilizations arose in The Third World...most of the material resources that facilitate the easy life those in the developed world enjoy are...from the Third World. Obviously, the Third World matters" (13).

His quote shows at the very least there are normative concerns that highlight the importance of studying minor power states. Consider, for example, the swath of problems most minor power states in this analysis face: poverty, disease, and government corruption in Africa; authoritarianism, human rights violations, and terrorism in the Middle East; and economic underdevelopment, social exclusion, and increasingly leftist government regimes in Latin America. Latin America, for example, is home to some of the poorest nations in the Western world such as the lower Central American isthmus and the Andean group of nations including Ecuador, Peru, and Bolivia. Perhaps better known is the ongoing battle against illegal drug proliferation and exportation in many of these Latin American states. The narcotics trade alone

contributes to the illicit employment of many of Latin America's poorest citizens as well as to the political instability and ineffectiveness of the ruling governments.

In Africa, the basic requirements for human survival are in short supply daily. A range of bacterial and viral diseases threaten millions each day and the necessary drug therapies such as antibiotics and vaccinations are in constant short supply. The lack of food sources and potable water cause significant amounts of death each day as well. Even more, political factions and violent guerilla groups undermine many of the legitimately elected African governments and propagate terror, violate human rights, and use violence against civilians regularly. The Middle East, even with its massive oil revenues, suffers from similarly low standards of living and deplorable human rights enforcement. Additionally, Middle Eastern states struggle constantly to suppress the destabilizing effects of terrorist activity and attacks upon their citizens.

Just as important, however, recent and current political events serve to highlight the overwhelming relevance of analyzing and understanding the behavior of not just minor powers but *regionally contained* minor powers involved in arms racing. Arms racing in the Middle East tends to stoke the fears and apprehensions of the larger global community with even more urgency. For example, the large expansion of both the Iranian and Iraqi militaries in the 1980's was of serious concern to all states in the Middle East region. Additionally, Israel's arming behavior affects the entire region especially with respect to states such as Iran, Syria, and Egypt.

Some of the more important and closely watched recent international developments have also involved the acquisition and production of various arms and

weapons. In the summer of 2007 the United States drew criticism for fanning a regional arms crisis in the Middle East through a massive sale of weapons to Saudi Arabia in an effort to counterbalance against an increasingly belligerent Iranian government. Steven Wright, a professor at Qatar University, notes that "It is a flawed logic for Washington to see the arms sales as a means of strengthening its position against Iran and enhancing regional security" (Janardhan, 2007).

Furthermore, Iran has been steadily bolstering its military forces over the last decade reports the Associated Press (Shetty, 2005). Their ramping up of military forces can be attributed to longstanding Iranian grievances with surrounding neighbors and most recently the deterioration of diplomatic relations with the United States as well as Iran's potential to become involved (negatively) in Iraqi affairs of state. In mid July of 2008, Iran conducted a series of medium and long range missile tests which Tehran indicated were a direct response to recent Israeli war games and weapons demonstrations against Iran. The Iranian air force commander General Hossein Salami quickly indicated the missiles were a display of Iranian power and the weapons would "demonstrate our resolve and might against enemies who in recent weeks have threatened Iran with harsh language" (Hirsh, 2008).

In Latin America, a region often associated with social unrest and domestic political instability but not necessarily interstate conflict, the threat of regional military instability has been introduced by the arms increases of several states. Venezuela's Hugo Chavez has bolstered his populist/socialist rhetoric with real increases in his country's military portfolio that have concerned more moderate neighboring states and

frustrated United States officials. His administration has upheld a commitment instituted a decade ago to increase the numbers and raw capability of its military forces. Flush with significant buying power from its oil revenues Venezuela continues to expand its military hardware by making large purchases from states like Russia, China, and Iran who are often sympathetic (though perhaps not explicitly) towards Venezuela's socialist and anti-American rhetoric.

Raul Zibechi (2007), a contributor to the Americas Program in Washington, DC, notes Venezuela has a keen interest in offsetting the advantages Chile has enjoyed due to its excellent political relationship with the United States who continues to send advanced weaponry and arms to the Chilean military. In attempting to achieve regional military superiority, Venezuela is also fortifying itself against Colombia (another American ally) and taking actions meant to reinforce claims by the Chavez administration of an imminent invasion by the United States military. Specifically, Zibechi notes about Venezuela's pursuit of arms:

> "It [Venezuela] also seeks to buy anti-air M1 Tor missiles (similar to the ones just acquired by Iran), 24 SU-30 jetfighters, 30 transport and attack Mi-35 helicopters, all from Russia, and half a dozen Military Corvettes and a dozen Spanish transport airplanes. Until now Venezuela has spent US$3 billion in weapons and now there is speculation that it could acquire between five and nine conventional submarines (diesel-electric). Although it doesn't amount to talk about a regional arms race, the truth is that Chávez appears to be developing a defense strategy" (Americas Program, July, 2007).

In the Andean region of South America, states including Chile, Peru, and Bolivia continue to harbor disdain for one another as the result of territorial acquisitions and losses dating back to the end of the nineteenth century. Peru has raised concerns about

recent Chilean arming citing the behavior as having the potential to inflame an already tense relationship amongst the Andean group (UPI, 2009). With Chile's apparent goal of becoming the regional military power Peru now faces the choice of either standing down or ramping up its own arms portfolio. Additionally, there is a concern about the potential for building strong militaries with advanced weaponry in Latin America due to its relatively high development when compared to the Middle East and Africa, for example.

Even Africa, a continent with no shortage of humanitarian crises, plays host to dangerous arms competitions amongst countries in both the north and southern regions. Ethiopia and Somalia continue to modify their militaries as a result of their sustained distrust and violent history with one another. Egypt, Algeria, and Libya all play crucial roles in the arming and militarization of North Africa. In less economically developed Southern Africa territorial concerns several years ago incited states such as Namibia and Botswana to seek increased armaments and military capacity in their efforts to settle land disputes in the region. Observers of the crisis between Namibia and Botswana did not hesitate to identify the situation as a legitimate regional arms race (Vines, 1996).

What these brief synopses should suggest is that minor power arms racing is very much pandemic, produces unwanted and dangerous regional implications, and can quite easily develop into larger crises affecting the major powers. The stories above show how some of the most important events of the modern international landscape tend to involve issues related to arms and arms acquisitions. Although many more

examples surely exist, these brief synopses support my central argument that arms carry significant *meaning* and *implications* for states in the international system. Yet, even if arms competitions do not lead to conflict amongst these states, minor powers are exhausting crucial and scarce resources on weapons and military expansion as opposed to alleviating some of the major social and economic problems they continue to face.

This is because for states in each of these regions even low levels of resources devoted to the military and arms races affects the ability of each state to remedy some of the many domestic social, political, and humanitarian issues (and in many cases, crises) they face. Indeed, the Central Intelligence Agency's World Fact Book (2008) analyzes the military expenditures of states as a percentage of their gross domestic product (GDP).[5] For 2005-2006 none of the top fifteen ranked states[6] are major powers. The top seven states are all in the Middle East, five of the remaining top fifteen ranked states are African nations, and a majority of the top forty ranked states are also spread out between the Middle East, Africa, and Latin America:[7]

Table 1.1
CIA World Fact Book: Military Expenditures

[5] Table 3.1 is taken directly from the CIA World Fact Book located online at https://www.cia.gov/library/publications/the-world-factbook/index.html

[6] The top fifteen ranked states spent from a minimum of 5.5% to a maximum of 11.4% of their GDP on the military. The United States ranked 28th with 4.06%.

[7] The top fifteen ranked are from highest to lowest are Oman, Qatar, Saudi Arabia, Iraq, Jordan, Israel, Yemen, Armenia, Eritea, Macedonia, Burundi, Syria, Angola, Mauritania, and Maldives.

Rank	Country	Mil. Exp. (% of GDP)	Date
1	Oman	11.40	2005 est.
2	Qatar	10.00	2005 est.
3	Saudi Arabia	10.00	2005 est.
4	Iraq	8.60	2006
5	Jordan	8.60	2006
6	Israel	7.30	2006
7	Yemen	6.60	2006
8	Armenia	6.50	FY01
9	Eritrea	6.30	2006 est.
10	Macedonia	6.00	2005 est.
11	Burundi	5.90	2006 est.
12	Syria	5.90	2005 est.
13	Angola	5.70	2006
14	Mauritania	5.50	2006
15	Maldives	5.50	2005 est.
16	Kuwait	5.30	2006
17	Turkey	5.30	2005 est.
18	El Salvador	5.00	2006
19	Morocco	5.00	2003 est.
20	Singapore	4.90	2005 est.
21	Swaziland	4.70	2006
22	Bahrain	4.50	2006
23	Bosnia and Herzegovina	4.50	2005 est.
24	Brunei	4.50	2006
25	China	4.30	2006
26	Greece	4.30	2005 est.
27	Chad	4.20	2006
28	United States	4.06	2005 est.
29	Libya	3.90	2005 est.
30	Russia	3.90	2005
31	Tajikistan	3.90	2005 est.
32	Cuba	3.80	2006 est.
33	Djibouti	3.80	2006
34	Cyprus	3.80	2005 est.
35	Zimbabwe	3.80	2006
36	Namibia	3.70	2006
37	Colombia	3.40	2005 est.
38	Gabon	3.40	2005 est.
39	Egypt	3.40	2005 est.
40	Turkmenistan	3.40	2005 est.

In addition a large portion of the minor power states listed above are actually increasing the size of their military forces at a rate equal to or higher than some of the most important major powers of the system. These basic figures alone indicate 'problem areas' – states and regions that appear to be spending significant resources on their militaries – and I argue it is critically important to understand whether these and other minor powers are involved in dangerous arms racing within their regions and if arms racing is facilitating interstate conflict amongst such states. I have also argued that from a research perspective there is much yet to be learned from studying the minor powers of the international system.

It is clear minor power states continue to gain influence in the international arena and the data above indicates minor powers are engaged in the same type of arming behavior as major powers; again, the rankings above clearly show a large number of developing nations continue to spend significant amounts of scarce resources on their militaries. As Lemke (2002) notes a majority of people live in the developing world and thus the governments of minor powers are increasingly important to not only the fates of their own citizens but to the fortunes of people living in neighboring states and around the world.

Taking this a step further, arms and especially arms races amongst minor powers therefore have the potential to be enormously destructive for an overwhelming number of the world's citizens. Sample (2002) concludes "...we must remember that a significant segment of the world's population lives in minor states, and wars between them destroy individual lives just as surely as any general war" (670). Given the

resources expended on military expansion come at the expense of critical economic, social, and humanitarian development for many of these states it is entirely appropriate to want a better understanding of the arming behavior and conflict propensity of such minor power states.

1.5 Focusing on Issues

Issues drive international politics amongst states. They are present in every facet of international relations and shape the relationships states have with one another. Indeed, if there were no issues over which states competed then there would be little reason for states to interact and virtually no likelihood for militarized conflict. Keohane (1984) effectively described such a situation as 'harmony' and noted "Harmony is apolitical. No communication is necessary, and no influence need be exercised" (53). Keohane, of course, concluded harmony is essentially absent in world politics and this absence of harmony means states must grapple with issues constantly. Thus, the power of issues lies in the extent to which they affect the interactions of states: specifically, issues provide a context for states to become concerned with one another. Depending on the issue, a shared concern can quickly become serious tension and contention. My dissertation, therefore, is about identifying such states in competition with one another and determining if these states arms race and, ultimately, become involved in conflict with one another.

The theory employed in this dissertation is rooted in the steps-to-war approach to international relations (Vasquez, 1993; Senese and Vasquez, 2008) which utilizes an

issue based understanding of arms racing and international relations: the notion of contention over issues is therefore the *foundational assumption of my theory of arms racing and conflict.* That is, to understand and properly study arms races means to correctly identify not just whether pairs of states were increasing their arms over time but whether any given pair of states are actually directing these increases *against one another.* The importance of this theoretical orientation is explained in Senese and Vasquez (2008) who argue convincingly: "The fundamental factors that distinguish states that never go to war from those that do center on the *issues that divide them* [emphasis added] and, more importantly, how they handled those issues" (174).

Recall the general statement made earlier that arms racing requires time and motive: in this dissertation I identify arms racing based on a set of operational criteria that will require a certain increase in overall arms stockpiles over some period of time and in the context of some *observable tension directed against the opposing state*. This notion of underlying tension amongst states is a critically important part of my analysis of arms racing in this dissertation: I argue issues drive the international politics between states and that it is contention and disagreement over such issues that *precede* arms races.

Issues are a foundational concept in my dissertation because they explain why certain states become concerned with other states and how contention over such issues can lead to arms racing and potential conflict. My claim is bolstered by the influential work of Mansbach and Vasquez (1981) who argue clearly that "Substantive issues lie at the heart of politics, providing not only an overall purpose to contention, but having a

major impact on the way in which contention is conducted" (69). A recent piece of research by Hensel et al. (2008) begins with the simple assertion that "Contentious issues are important sources of militarized conflict" (117). Indeed, the role of issues in shaping international relations has shaped the research agendas of some of the most important scholars involved in international relations/conflict studies.

The importance of issues amongst states permeates my dissertation and is the foundation of the steps-to-war theory (Vasquez, 1993; Senese and Vasquez, 2008) I advance later in chapter three. Issues are the antecedent factors that produce contention and competition amongst states which then encourages these states to engage one another in dangerous arms racing. Conversely, if there are no issues at stake then there is little reason to expect disagreement, arms competitions, and, ultimately, conflict between states. Noting that the realist paradigm has been explicitly concerned with explaining why states fight Mansbach and Vasquez (1981) suggest realists fail to realize "...cooperation/conflict is almost an epiphenomenon of the attempt to get actors to shift their issue position" (233).

The steps-to-war theory I discuss in chapter three relies heavily on the notion that the salience of issues directly affects how states will interact with one another in the international system and assumes there can be no discussion of arms racing and certainly no potential for conflict unless there are issues over which states are competing with one another. In his seminal work and the first comprehensive presentation of the steps-to-war theory Vasquez (1993) notes without qualification that

"All wars begin with issues..." (124). For him, war and international conflicts are the direct results of states unable to resolve salient issues.

Such issues forcefully and quickly bring states into contention with one another and set into motion the use of 'power politics' that all too often funnels states down the path to militarized conflict (Vasquez 1983; 1993). Since issues are the primary reasons for the dangerous competition and contention amongst states that leads such states into conflict with one another then it becomes absolutely critical to shift the focus away from notions of power and capability exclusively. Instead, Vasquez (1993) argues, scholars must understand the factors that bring about disagreement and tenuous relations at the very outset – the issues themselves: "The way to peace is...to understand what kinds of issues are prone to violence and how they might be dealt with differently" (151).[8]

Issues have indeed become an indispensable component in a variety of important research programs.[9] While only a sampling of related research topics, the issue based approach to international relations research has been used in studies of territory and conflict (Vasquez, 1995; Hensel, 1996), rivalry formation and conflict (Vasquez, 1996; Valeriano, 2003), rivalry termination (Bennett, 1996), alliances and conflict (Gibler, 1997), and the enforcement of negotiated peace settlements (Werner, 1999). New and important research in the area of foreign policy decision making also

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[8] Of course, Vasquez (1993; 1995, 2000) has argued and provided empirical evidence suggesting territory to be the most salient of all issues for states.

[9] I would note here this has not been the case, however, in much of the arms race literature. The role of issues in arms racing and conflict is something I therefore develop throughout the following chapters. Hence, I posit my orientation around the role of issues in arms racing and conflict as a primary contribution of this dissertation.

incorporates the issue based approach to international relations and the foreign policy behavior of states. In their two-good theory of foreign policy decision making Palmer and Morgan (2006) begin their theory by noting "In developing our model, we begin with the notion that politics, whether international or domestic, occurs over issues...The essence of politics is the struggle among political actors to achieve favorable outcomes on issues" (19).

Even some of the exclusively rational choice and formal approaches to the study of conflict and war have identified issues as at least a partial explanation for states' inability to avoid militarized conflict. Fearon (1995), for example, theorized that war results when states are unable to converge their individually held preferences within a mutually acceptable bargaining range.[10] He argues such bargaining failures are primarily the result of states' incentives to misrepresent information as well as the inability to credibly commit to a proposed negotiated settlement. Nonetheless, Fearon notes the outbreak of war may also be due to the indivisibility of issues:

> "States might be unable to locate a peaceful settlement both prefer due to *issue indivisibilities.* Perhaps some issues, by their very natures, simply will not admit compromise. Though neither example is wholly convincing, issues that might exhibit indivisibility include abortion in domestic politics and the problem of which prince sits on the throne of, say, Spain, in eighteenth- or nineteenth-century international politics...War-prone international issues may often be *effectively* indivisible, but the cause of this indivisibility lies in domestic political and other mechanisms rather than in the nature of the issues themselves" (381-382).

[10] This refers to the 'rationalist' explanation for war in which rationally motivated states are unable to achieve *ex ante* agreements that would avoid costly warfare.

Unfortunately, one of the fundamental problems with previous arms race and conflict studies has been the failure to incorporate issues as the primary factors that drive arms races and conflict.[11] Scholars either assumed all states were in competition with one another all of the time or chose to study the influence of arms racing on the escalation patterns of states already involved in serious conflict. Since both approaches dismiss the centrality of issues in producing contention and competition amongst states such strategies are problematic for analyzing the effects of arms racing on international conflict.

As I continue to emphasize one of my primary goals in this dissertation is to utilize the issue based approach to international relations in my analysis of arms racing and international conflict. This is because intuitively states where tension is present are the *only* states likely to be arms racing one another. Hence, as I argue theoretically in chapter three the presence of contentious issues is the very first step in my analysis of arms racing and conflict: there must be some underlying level of tension – contention over issues – driving a hostile relationship between states. Only in such states is an analysis of arms racing and the subsequent likelihood of conflict appropriate.

In some of the brief examples discussed earlier it is clear the role issues play in creating and proliferating tension and competition amongst states. In the Middle East, the issue of a sovereign Palestinian homeland continues to drive much of the regional hostility. Issues related to natural resources such as oil, arms transfers, and

[11] A recent piece by Rider (2009) argues many previous arms race studies have ignored the factors that actually produce arms races to begin with. He notes "Most arms race research focuses on the consequences of arms races, but this focus has come at the expense of an equally important question: why do states engage in arms races in the first place?" (Rider, 2009). The author suggests it is issues – territorial issues, specifically – that drive arms races between states.

militarization as well as religious (Sunni and Shi'ite Muslims) and ethnic divisions (Arabs and Persians) also contribute to ongoing tensions between many states in the Middle East. In Latin America, leftist regimes continue to clash with more democratic and market based governments. Some leftist governments exploit the favorable relationship neighboring democracies enjoy with the United States to incite interstate competition and fan domestic populist rhetoric.[12] Longstanding territorial claims and access to natural resources also sustain contentious relations in the region. Lastly, African nations face a host of potentially troublesome issues daily. Ethnic tensions and border claims[13] – many the result of colonial gerrymandering – continue to strain the governments of many African nations. Precious resources and corrupt, militaristic governments also strain relationships between neighboring states. Simply put, contention over issues drives tension between states and provides the context in which arms racing can develop and lead to interstate conflict.

1.6 Leaving the Realist Paradigm Behind

It is important to note here, however, the issue-based, steps-to-war approach I adopt in this dissertation is perhaps in contrast to previous arms racing and conflict studies utilizing what scholars have come to collectively refer to as the realist paradigm. In modern political science and international relations scholarship the realist paradigm

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[12] This was seen most recently with Venezuela's condemnation of Colombia's attack against guerilla groups in Ecuador. In criticizing the United States for sanctioning Colombia's actions Venezuelan President Hugo Chavez claimed "It must be said: They, the empire [The United States] and its lackeys [Colombia], are war. We are peace. We are the path to peace" (Romero, 2008). Please see full article at: http://www.nytimes.com/2008/03/06/world/americas/06venez.html

[13] Disputes between Somalia and Ethiopia over the decision in 1948 by the Allied nations to grant the Ogaden region to Ethiopia reflect this ongoing problem exactly.

has developed and proliferated through the works of scholars such as Morgenthau (1948), Waltz (1979), and Mearsheimer (2001), to name only a few. Yet, many international relations scholars argue the origins of the realist paradigm can be traced back to the ancient scholars and historians of Greece and the surrounding Mediterranean system of city-states. Among others, Cusack and Stoll (1990) note: "The roots of realism in the study of international politics stretch back thousands of years and across cultures. It is clearly recognizable in Thucydides' (400 B.C./1954) work on the Peloponnesian War..." (19).

Few would debate realism has had an immeasurable effect on the field of international relations and most would agree it has been to varying degrees the dominant theoretical account of how states operate in the international system. Valeriano (2009) even contends that "Realism remains the dominant paradigm of international relations theory" (179). Indeed, some of the most important international relations scholars have worked diligently to "...provoke a debate about the realist paradigm..." in the hopes such a debate would "...loosen its grip on the field" (Vasquez, 1998: 190). To a certain extent, the work of such dissenters has proven fruitful; although the realist paradigm has enjoyed considerable longevity its utility as a systematic, scientifically sound approach to understanding the international interactions of states has diminished significantly.

In many ways the realist paradigm – massive as it may be – has been hijacked by its own theoretical offshoots. Consider just three of the most important realist authors introduced earlier. Morgenthau (1948) – often considered the father of classical realism

– argued the principal goal of man (and therefore states) is to acquire power over others. Much of his theoretical argument about power is derived from assumptions regarding the nature of man as developed earlier in Thomas Hobbes' classic treatise *Leviathan* in 1651. For Hobbes, man exists in a state of nature where life is more often than not 'brutish and short'; as a result, power is the most direct means by which man (a state) can combat the threats posed by others and flourish. Thus, Morgenthau posited man's *nature* provides the incentives for states to acquire power in the international system.

Waltz (1979) argued differently. In his neorealism, the morality of man plays no role in the decisions states make towards one another. He argues the international system is anarchic and thus lacking any supreme authority or enforcement mechanism and that the system is also *structured* and the structure of the international system cannot be meaningfully changed by any one state. Since states cannot change the rules of the system and because the intentions of others are always uncertain they attempt to acquire a favorable distribution of power. Given that Waltz assumes states seek *security* above all else, the rational strategy for all states is to bolster their own prospects for survival by pursuing as much power as possible for themselves. The importance of the structure of the system in Waltz's account of international relations has led some to refer to his theory as structural realism.

Mearsheimer's (2001) work provides another twist on the realist paradigm. He utilizes the same basic assumptions of previous realist scholarship but argues states must not only pursue power but use it whenever possible to preempt and defeat

military threats from other states. Herein lies the 'tragedy' of international politics: the perpetual desire of states to acquire more and more power through whatever means necessary including the use of military force against other states. Therefore, the structure of the system motivates states to pursue power but the accumulation of power cannot simply be for defensive purposes (survival) as neorealists argue; instead, it is a political imperative that states act aggressively and use their military power whenever possible to neutralize potential threats and hazards from other states in the international system. The end result is an international system where the most important actors – the major powers – are in constant conflict with one another.

Hence, what is seen here are three different realist scholars with three different versions of realism and investigating other realist scholars would produce similarly varied accounts of realism. Thus, the realist paradigm has faced strict criticisms for its propensity to vary its assumptions and tenets from scholar to scholar. In his critique of the realist paradigm Vasquez (1998) provided strong arguments suggesting realism was now a *degenerative research program*. His arguments are grounded in a philosophy of science approach using logical standards found in the work of Lakatos (1970). The essential argument advanced by Lakatos (1970) and utilized by Vasquez (1998) involves the idea of theory falsifiability. It is this principal that realists and the realist paradigm have continued to violate with each iteration of realism.

The problem is acute. If assumptions and basic tenets of a theory continue to change and shift from generation to generation, or even from author to author, then it becomes virtually impossible to falsify a theoretical argument since the theory can be

revised to account for all potential empirical outcomes (evidence). Vasquez (1998) thus notes:

> "Lakatos (1970: 116-117) sees a research program as degenerating if its auxiliary propositions increasingly take on the characteristic of ad hoc explanations that do not produce any novel (theoretical) facts and new "corroborated" empirical content...A degenerating problemshift or research program, then, is characterized by the use of semantic devices that hide the actual content-decreasing nature of the research program through reinterpretation (Lakatos, 1970: 119). In this way, the new theory or set of theories is really ad hoc explanations intended to save the theory (Lakatos, 1970: 117)" (243:244).

As a result, the realist paradigm has lost credibility amongst many scholars who find it nearly impossible to identify 'realism' proper. Instead, most tend to view realism as suffering from the exact form of degenerative theory shifts and ad hoc revisions outlined by Vasquez (1998) above and since each version of realist doctrine therefore appears to explain something different many conclude realism ultimately explains very little at all. This fact alone makes it very difficult to adopt a realist approach to my study of arms racing and conflict in this dissertation even if for some it would seem a natural choice.

Beyond the philosophy of science problems associated with the realist paradigm there is at least one important theoretical deficiency (which I have already alluded to numerous times above) that is especially problematic for an analysis of arms racing and interstate conflict. A strict interpretation of realism suggests all states must be worried about all other states, all of the time. Since the system is anarchic states can only rely upon themselves and must assume all other states are potential threats, if not outright enemies. The logical choice for any state wishing to compete and survive is to thus

pursue a strategy of arming as much as possible with the understanding that other states in the system are likely pursuing the same strategy. Realist scholars argue such competitions for security invariably lead states into the familiar security dilemma. Jervis (1976) summarizes the above dynamic succinctly:

> "The roots of what can be called the spiral model reach to the anarchic setting of international relations. The underlying problem lies neither in limitations on rationality imposed by human psychology nor in a flaw in human nature, but in a correct appreciation of the consequences of living in a Hobbesian state of nature. In such a world without a sovereign, each state is protected only by its own strength. Furthermore, statesmen realize that, even if others currently harbor no aggressive designs, there is nothing to guarantee that they will not later develop them" (62).

The quote by Jervis (1976) clearly reiterates the realist strategy that all states should arm against all other states all of the time. Unfortunately, this is simply not the case. If states acted as realists theorize, then the international system would be one of perpetual and large scale arming and continual militarized conflict. Any casual observer of international politics knows this is not the case. Practically speaking, states lack the economic resources to behave as realists expect: a true attempt by any state to arm itself against all other states (or even many other states) would exhaust its resources on all fronts in little to no time.

Apart from the practical inability for states to perpetually arm themselves against all other states there is a more theoretically oriented explanation for why states are not following realist doctrine all (or even most) of the time. It is a fact *most states, most of the time have no reason to compete (arm) against one another.* This means one of the central assumptions of realism – that states must assume the worst intentions

about others – is in direct contradiction to what is borne out in the real world everyday. Vasquez (1993) notes this much in arguing that "The great mistake of realism has been to assume that a struggle for power is a constant verité of history..." (148). As a result, the critical policy prescription derived from this realist assumption must be rejected: most states should *not* be concerned with most other states at any given moment in time and thus should not pursue a policy of increased arming against them.

This is true of even the most 'important' states in the international system. Consider the case of the United States, for example. Right now in 2009 there are but a handful of states that most scholars and policy makers alike would consider of serious concern to the United States: Iran, North Korea, and Venezuela come to mind first. Perhaps some might include Russia in this list but even though tensions between the United States and Russia have fluctuated from relatively good to relatively poor the prospect of any serious militarized conflict remains quite low. My point is made even stronger when discussing minor powers – the focus of this dissertation – and their relationships with one another. These are states with primarily regional concerns that simply do not have meaningful enough political relations and interactions with most other states throughout the international system such that they would engage in arms racing with these states; that is, their interests and concerns are with a select group of states with which they inhabit a certain geographical region.

The inability of the realist paradigm to provide an accurate description of the international system as I have characterized it above stems from one critical oversight: the role of issues in international relations. In their comprehensive offering of an issue

based approach to international politics Mansbach and Vasquez (1981) identified the realist paradigm as an approach to international politics that focused too much on power and not enough on the *issues* that drive states towards either peace or conflict:

> "The issue challenge to the realist paradigm stems from the claim that the single issue of power fails to account for the existence of a global community, primitive has it may be, and the patterns of cooperation and peace that are actually more characteristic of it than war and conflict...The belief that the struggle for power is the dominant issue fails to accommodate the multiplicity of values and stakes for which actors both cooperate and compete" (11).

They conclude by explicitly noting how "...the realist paradigm ignores *issue* as a significant variable" (Mansbach and Vasquez, 1981: 23). Hence, as I have made clear I adopt the issue based approach to international relations in my dissertation and assume only between states where contentious issues exist can there be arms racing and – just as the steps to war theory suggests – arms races are one of the critical events that lead states down the path to militarized conflict.

1.7 Dissertation Roadmap

Again, at least some scholars would agree that the arms race literature has suffered on two primary fronts: the absence of strong theoretical motivation and a general lack of consistent empirical findings. As I have mentioned in this introductory chapter I seek to improve on both areas by utilizing an important and clearly developed theoretical framework – the-steps-to-war theory – that provides the logic linking arms races to militarized conflict. This theoretical framework coupled with the empirical results provided in the following chapters establishes a strong and positive relationship between arms racing and conflict.

Thus, the plan of the dissertation is as follows: chapter two presents a review of the relevant literature in an effort to locate my research question within this specific stream of quantitative arms race scholarship; chapter three follows where I lay out the steps-to-war theory as characterized most notably by Vasquez (1993) and Senese and Vasquez (2008) that provides the theoretical account linking arms racing to conflict onset from which I derive the central testable hypothesis; chapter four contains the design approach which details the data, methods, and operationalizations of the key concepts and variables; chapters five, six, and seven show the empirical results separately for each of the three regions analyzed (the Middle East, Africa, and Latin America); chapter eight concludes the dissertation with a summary discussion of the empirical results, additional implications, as well as suggestions for future related research.

Chapter 2

Arms Racing: Revisiting Some Selected Literature

2.1 Introduction

One of the earliest and most well known mathematical and formalized approaches to the study of international relations focused upon arms races and their implications for states and the international system. Among other scholarly contributions, Lewis F. Richardson (1960) contributed to the study of international conflict by offering an explicit and formalized model of arms racing. Even as a relative 'outsider' to the study of political science and international relations (originally a mathematician and meteorological expert) Richardson recognized the centrality of arms racing to the escalation of international crises and the onset of interstate conflict.

Indeed, Richardson argued the outbreak of World War I was significantly provoked by the uncontrolled arms racing of the European powers including Germany, Great Britain, France, and Russia. This chapter begins with a discussion of Richardson's invaluable contribution to the quantitative and scientific study of arms racing and international conflict, surveys some of the more important and relevant quantitative arms race research, and concludes with a brief overview of my intended contributions.

2.2 Richardson's Contribution

The Richardson model – a set of differential equations – conceptualizes arms racing as an international interaction driven by the behavior and perceptions that the involved states have of one another. Specifically, *State A's* arms portfolio varies over time as a function of *State B's* arms stockpile; as *State B* increases its arms stockpile so attempts *State A* to match these increases. That is: "In an arms race, the opposing sides try, with some success, to maintain a balance of power...the ratio, or the difference, between their armaments remains fairly stably near to a constant" (Richardson 1960, 23).[14] Although the primary component of the Richardson arms race model is indeed the armament level exhibited by the other state the total level of weaponry a state achieves is also determined by the amount of 'grievances' *State A* holds towards *State B* as well as a parameter representing the fatigue and costs associated with maintaining and expanding an arsenal:

[14] Note that while the objective is to maintain a balance of power through arming, the equations nonetheless allow for the possibility of the arms race to become unstable and 'blow up'.

The Richardson Linear Theory of Two Nations[15]

$$dx/dt = ky - \alpha x + g$$

$$dy/dt = lx - \beta y + h$$

where the change in x's arms over time t is a function of the menaces posed by y, some positive defense coefficient k, some negative constant α representing the fatigue and costs of maintaining defenses, and some parameter g symbolizing the grievances held against the opposing state

Although Richardson himself believed there was a strong relationship between arms racing and the likelihood of international conflict (as did other scholars), the quantitative conflict literature since his original study has been much less consistent regarding the effects of arms races on conflict. Scholars have indeed approached the study of arms racing in a variety of ways since Richardson's original study.[16] Although most researchers have analyzed arms racing out of the belief that arms races lead states into war with one another the actual results of these studies have found no such consistent relationship. Therefore, my own research in this dissertation is partially motivated by some of the inconsistencies found in the quantitative literature.[17]

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[15] Taken from Chapter 2 of Richardson (1960).

[16] An early piece by Huntington (1958) distinguished between quantitative arms races and qualitative arms races where qualitative arms racing refers to a state "...replacing its existing forms of military force (normally weapons systems) with new and more effective forms of force" (24). Some scholars argue, however, qualitative advancements are relatively rare and usually confined to only the most powerful states in the system and so research has tended to focus upon quantitative arms racing.

[17] Some early studies critique the specification of the Richardson model itself. Majeski and Jones (1981) identified twelve cases of purported arms racing and concluded the Richardson model was overly restrictive and failed to properly specify any of the twelve cases (in seven cases the dyad's expenditures were entirely independent of one another while in the other five only some level interdependence could be established). Additionally, Stoll (1982) argues that Richardson's equations make it extremely difficult to determine whether empirical results obtained from estimating his differential equations are being driven by external factors (your enemy's arms acquisitions) or internal factors (bureaucratic momentum). Since the two main explanatory parameters undoubtedly suffer from multicollinearity, the unfortunate implication is that the Richardson model will tend to provide coefficients that describe a given data set quite well *regardless* of whether the true underlying data generating process was externally or internally driven.

A typical quantitative, mathematically oriented piece of arms race research in the Richardsonian tradition is Lambelet et al. (1979). This piece added to the theoretical discussion by arguing the process of arms racing is driven through some combination of mutual and self-stimulation. Although the Richardson model clearly indicates arms racing is about both external threat (mutual stimulation) in addition to some internal constraints (the fatigue associated with maintaining defenses) Lambelet et al. (1979) noted that "While the possibility of self-stimulation is not altogether ignored in the work of Richardson and his followers, the emphasis is clearly on the mutual-stimulation (action-reaction, positive feedback) mechanism in arms races" (49). Hence, they used the Richardson model shown above as an example of arms racing driven primarily – though not completely – through mutual stimulation. In this approach, an arms competition occurs through an action-reaction process where each move (arms increase) is matched or exceeded by the other state. Therefore, the arms race is almost entirely the result of two states reacting to one another, hence a mutual stimulation dynamic.

The authors, however, argued self-stimulation may be playing a larger role in driving arms races and should be included in a unified theory of arms racing. The self stimulation approach adopts the traditional bureaucratic/incrementalist framework popularized in the studies of budgetary politics. Self stimulated arms racing is thus conducted through a host of domestically driven factors such as "bureaucratic inertia, technological momentum, economic and political vested interests, autistic perceptions, or some broad, sociological concept such as the military industrial complex" (Lambelet

et al. 1979: 49). Their contribution was important because the authors used data to empirically evaluate the extent to which mutual-stimulation and self-stimulation drives arms racing. Using defense expenditure data for the United States and Soviet Union from 1945-1975 to model the American-Soviet arms race they concluded neither a purely mutual nor purely self-stimulated approach adequately modeled the process of arms racing between the United States and Soviet Union.[18]

In addition to the theoretical considerations discussed above[19] there has been a substantial literature dealing with the modeling and quantitative study of arms racing not all of which I can reasonably cover in this literature review. Indeed, in a comprehensive review piece of the arms race literature over the ten year period 1970-1980 Moll and Leubbert (1980) claim "We found over eighty studies in addition to the reviews, and we suspect that our survey has not been exhaustive" (157). With this in mind, some of the earliest quantitative and statistical estimations of arms racing were also developed by Lambelet (1971; 1979). These pieces used basic econometric techniques such as OLS regression to help bring the study of arms racing into the quantitative, empirically rooted scientific study of international relations and conflict. The focus was on understanding defense expenditures in the context of overall GNP figures and how such spending related to the onset and maintenance of arms racing.

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[18] Specifically, Lambelet et al. (1979) found that "...mutual and self-stimulation tend to be about equally important in the United States...Mutual stimulation is seen to be important in the Soviet Union too, even more so than in the US...The most striking finding, however, is how large self-stimulation seems to loom in the USSR. Thus, overall the conclusion would be that Soviet self-stimulation is largely what keeps the arms race going" (62).

[19] See Lambelet (1975) for some additional theoretically focused discussion of arms racing and conflict.

Lambelet (1986) himself notes these early pieces suffered from some very obvious econometric problems, most notably a low number of observations and high number of model parameters. However, these early pieces tend to investigate more the strategies for modeling the arms race itself. In contrast, I am concerned more with the relationship between arms racing and conflict and less so with *a priori* considerations of what theoretical and/or statistical factors may be influencing the arms race.[20] To reiterate again, although I develop my own model of arms racing the dependent variable of interest is the presence of international conflict and not the arms race itself.

2.3 Chronicling Relevant Quantitative Studies of Arms Racing

The following is an overview of a series of related arms race studies conducted over the past several decades. I review these studies because they are important and relevant precursors for my dissertation for several reasons. First, the studies reviewed in this section represent a collection of related quantitatively oriented studies that produced *conflicting empirical results* regarding the relationship between arms racing and international conflict and war.[21] Second, each of the following quantitative arms race and conflict studies employed empirical data from the now widely used Correlates of War data project (Singer and Small, 1972; Small and Singer, 1982; Sarkees, 2000).

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[20] Obviously, variations in the actual modeling of an arms race can affect the likelihood of observing international conflict. However, the research focused on the modeling of the arms race itself presented above in Lambelet (1971; 1979; 1986) as well as in Lambelet (1973; 1987) and Isard and Anderton (1985) and Anderton (1989) is somewhat removed from my focus on arms racing and conflict (to which Lambelet [1975] is more related).

[21] These studies are not explicitly concerned with modeling the arms race or determining what factors may be driving arms racing; their primary focus is investigating whether arms racing leads states into conflict with one another.

Variables such as defense expenditures used to model arms racing, power, and instances of international conflict are all drawn directly from the COW project.

Hence, although I abandon the use of defense expenditure data in my dissertation the population of cases I analyze as well as the data I use to measure my dependent and control variables are all drawn from COW as well. Most importantly, however, is an observation made by Sample (1997) who notes "...attempts to find a direct link between arms races and war have met with mixed success, suggesting that conceptual, measurement, and sample differences in quantitative studies have affected the results of the studies..." (8). My overarching goal, therefore, is to resolve some of the inconsistent empirical results produced by the following group of studies

This dissertation is therefore located within a thread of quantitative arms racing and international conflict literature of which one of the early standard pieces is Wallace (1979). Analyzing a set of almost 100 militarized interstate disputes, he found that over 90% of those disputes which escalated to war involved an arms race. Such ostensibly strong results attracted some criticism, however; for one thing, the Wallace study selected on the dependent variable (conflict) so that it was unclear whether a population of cases existed that experienced an arms race but failed to reach conflict or war status. More specifically, scholars such as Weede (1980) criticized his population sample for consisting mostly of an abundance of World War I and World War II dyads. The dyads obtained from the two major world wars alone, it was argued, were driving a majority of the empirical results.[22] Additionally, Weede argued that Wallace's approach

[22] 19 of 23 of Wallace's (1979) conflict dyads that escalated to war were World War I/II dyads.

could not decipher whether the outbreak of war was the result of the arms race itself or instead an inability of one state to match the other state's rate of arming.

Several years later, Diehl (1983) raised additional concerns. His criticism was linked to Wallace's (1979) actual construction of the arms race index. The problem, Diehl argues, is multifaceted: to begin with, Wallace's analysis determines only whether the disputants are engaged in some form of rapid buildup but offers no confirmation of whether the rapid buildup is actually directed against one another; even more troubling notes Diehl (1983) is that the arms racing index is a simple multiplicative function. That is, under Wallace's (1979) construction an 'arms race' can be coded if one state has a very low arming index but if its opponent has a very high arming index. These two indices multiplied together would therefore give the impression of a bilateral arms race when, in fact, only one state is really engaged in a rapid buildup.[23]

Thus, Diehl (1983) conducted a reformulated analysis in which a new measure of arms racing was utilized that was "...constructed from the newly revised COW file on military expenditures...for each side in the three years prior to the initiation of the dispute" (208). His results linking arms racing and the likelihood of international conflict were far less conclusive: only about 25% of the disputes involving an ongoing arms race escalated into war. Diehl (1985) followed up his own study by investigating the likelihood of a unilateral arms buildup or a bilateral arms race ending in capitulation or war. Surprisingly, the presence of an arms race seemed to have little effect on

[23] Diehl uses the example of State A having an arms index of 100 (very high) but state B having an index of 1 (very low); multiplied together, this yields an arming index of 100 but betrays the fact that state B is not really engaged in a rapid buildup at all.

hindering a compromise or capitulation outcome (the 'no war' case) and unilateral stockpiling turned out to have little effect on the probability of victory.

Horn (1987) entered the debate by introducing yet another measure of a rapid mutual military buildup (arms race) that differed from Wallace's (1979). Relative to previous indices of racing, Horn's requirements for the presence of an arms race are more demanding. His measure analyzed major power disputes over the period 1816-1980: for an arms race to occur, a country's defense expenditures in the ten years preceding a dispute must be on average higher than in the entire temporal domain under scrutiny. Additionally, this increased spending must be higher in the second half of the period (that is, the last five years of the ten year window) than in the first half. This requirement ensures the arms race is actually spiraling upwards and not decelerating as time progresses. His principle findings using this measure are that longer lasting arms races – those spanning at least twelve years – are by far more war prone than shorter duration arms races – those lasting six years – which yielded no significant relationship.

What becomes clear at this point is that the empirical record concerning arms racing among major powers and the likelihood of international conflict is inconsistent, to say the least. The quantitative literature discussed above analyzing the relationship between arms racing and war ranges the gamut from extreme (Wallace, 1979) to very weak correlation (Diehl, 1983, 1985). In an attempt to reconcile these conflicting results Sample (1996; 1997) reconsiders Wallace's (1979) findings by using the alternative arms racing indices reviewed earlier from Diehl (1983) and Horn (1987).

In these two pieces, Sample slightly reconfigures Wallace's original dispute set (such as eliminating dispute dyads that formed towards the end of the world wars and removing dyads that entered into arms racing and/or conflict due to alliance involvement, for example) and then applies the Diehl and Horn measures separately to determine whether the relationship originally presented by Wallace holds. In so doing, Sample (1997) concludes that "Regardless of the measure used to determine racing behavior, and regardless of the dispute set used, the proposition that arms races are positively associated with the escalation of disputes to war is upheld by the data" (17).[24]

Her most comprehensive assessment of the debate is found in Sample (1998a). With the advantage of a larger available data set and improved methodological techniques, she conducts a multivariate analysis of the effect of major power arms racing and the likelihood of escalation to war. Using Horn's (1987) measure, she conducts the multivariate analysis over the temporal domain 1816-1993 involving all major power dispute dyads (approximately 230, 18 of which escalate to war). In an effort to rule out potential spurious correlations or intervening/omitted variable bias she includes several control parameters such as the presence of a territorial issue, a recent power transition, or the presence of nuclear weapons among other control variables. Utilizing a far more rigorous design, Sample's (1998) results still present a positive and non-random association between the presence of an arms race and the likelihood of escalation to war among major powers. While some of the additional

[24] Regarding one of the primary critiques of Wallace's (1979) original study, Sample (1997) notes that "Removal of controversial dyads from the World Wars does not alter the findings substantially (or in the assumed direction)" (7).

model parameters show significance and in the expected direction, her primary explanatory variable – arms racing – remains positive and significant in each iteration of her empirical model.

Nonetheless, large scale studies of the effects of arms racing came to a halt not long after the end of the Cold War and dissolution of the Soviet Union. After all, all of the pieces reviewed above were focused strictly on major power dyadic racing and conflict.[25] This is not to suggest, however, that absolutely no arms racing research has been conducted since Sample (1998a) over the past several years.[26] Bolks and Stoll (2000) and Stoll (2006) analyzed great power naval arms race competitions in the nineteenth century. Gibler et al. (2005) revisits the connection between arming and war by adopting Thompson's (2001) strategic rival dataset to then code for the presence of arms racing amongst these rivals. His objective is to eliminate the possibility of empirical bias by using the strategic rival dataset (qualitatively coded) in place of a traditional rivalry data set which already assumes the presence of militarized disputes. In so doing, the authors find that arms racing indeed has a positive effect upon dispute onset as well as escalation to war.

Studies Using Weapons Stockpiles

In addition to the lack of new arms race research, very few arms race studies (old or new) have incorporated the use of weapons stockpiles as quantitative indicators of

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[25] Sample (2002), however, does update her earlier multivariate studies by including minor power and mixed dyads into the analysis finding that minor power dyads are also more likely to *escalate* from militarized disputes to war during an arms race.

[26] For important and insightful formal modeling work on arms racing, see Kydd (1997; 2000, 2005).

increased arming. As I argue throughout and as I explain more fully in my research design chapter later much of this dissertation is based on the assumption that *arms stockpiles* are a fundamental component of arms races. Conceptualizing this approach was motivated largely by Bolks and Stoll (2000) and Stoll (2006). Introduced just above, both pieces are concerned with understanding naval arms race competitions among some of the world's great powers since the nineteenth century. Most importantly, the authors measure their naval arms races by collecting data on the number of capital ships maintained by each state's respective navy. Thus, in their effort to comprehend the decisions of states to increase and fortify their naval reserves Stoll (2006) and Bolks and Stoll (2000) incorporate the use of actual war ship figures for the various major powers over time. As Bolks and Stoll argue: "After all, wars are not fought with currency but with weapons and people" (2000: 589). This is my thesis exactly.

One study in particular represents, broadly, several of the central goals of this dissertation. McCubbins (1983) utilizes not only weapons stockpile data in his analysis of arms racing between the United States and Soviet Union but also investigates arms racing across different weapons systems of both states. He identifies six unique weapons systems present in both countries: strategic interceptors, tactical S.A.M, tactical aircraft, tanks, antitank missiles, and strategic bombers. His theoretical argument, however, suggests that different weapons systems have different policy goals; therefore, arms races are likely to occur between weapons systems with mutually incompatible policy goals as opposed to competitions between the same weapons

type.[27] Although restricted to only the United States and Soviet Union over a period of about 10 years (roughly 1965-1975), McCubbins (1983) is nonetheless a good example of a research design that used weapons stockpile data not just in place of defense expenditures data but also as a means by which to analyze different types of arms racing.[28]

Still, in much of the literature I have reviewed the most popular method for measuring arms racing has involved the defense expenditures of states. The studies discussed throughout this dissertation have almost all used defense expenditure data as the primary measure of arms racing. The problem with this traditional reliance upon defense expenditure data is one of validity: do defense expenditures accurately measure the phenomenon of interest (dyadic arms racing)? It is entirely possible the final defense spending figure presented by one state in one year contains expenditure elements that were not included in another state's defense figures for the same year.

For example, a state could report money spent on tanks as well as funds used for troop salaries, medical expenses, paid leave, pensions, research and development, or even subsidized weapons for allied states. Contrast that defense expenditure figure with one of a state who reports only money spent on the production and maintenance of critical weapons systems and vehicles. In addition to uncertainty about the

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[27] This theoretical approach is, of course, different than my own (and other approaches) that argue arms races occur between the same types of weapons. His own theoretical account is likely driven by the unique case of the United States, Soviet Union, and the presence of nuclear weapons in which some weapons were indeed specifically meant for either offensive nuclear attacks or nuclear deterrence. It should be noted he obtained mixed empirical results.

[28] Other scholars have utilized weapons stockpiles such an approach but in limited fashion: Ward (1984) adopted the use of American and Soviet stockpile counts to analyze the Cold War arms race while Lambelet (1973) relied primarily on troop levels and personnel.

composition of defense expenditures other issues of concern include problems with exchange rates, the international political economy, and variations in domestic political economic systems. Given these complications the reliance upon defense expenditure figures suddenly becomes less attractive.[29] Mullins (1987) summarizes the problem noting that "Nations also keep their accounts in all sorts of ways (and often change those ways), to the points where the defense budget means something different in virtually every state for which it is reported" (41).

Nonetheless, I do not believe previous and/or current studies making use of defense expenditure data lack substantive value. Whatever the shortcomings, states have taken and continue to take military expenditures seriously so the use of this data no doubt seemed a natural first step in attempts to uncover the relationship between military buildups and conflict and, in general, defense expenditure data probably provides a decent estimate of when states become involved in racing with one another. What I argue is the following: to the extent that empirical data is always an imperfect measure of some concept, any inaccuracies with arms stockpile data should be *far more benign* than those associated with defense expenditure figures. Simply put, arms races should be measured with arms stockpiles; hence, even though Diehl (1985: 252) makes a case for the use of military expenditure data, Diehl and Crescenzi (1998) – covered in more detail next – later argue that using armament stockpiles may indeed be a better way to move the literature forward.

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[29] Anderton (1989) indeed notes "The majority of empirical arms race studies use military expenditures to measure defense capability" but that "From a conceptual level, military expenditures are an unreliable measure of defense...significant parts of military expenditures are allocated to areas other than procurement, maintenance, and research and development" (352).

The most familiar arms race of the twentieth century, for example, was a clear example of two states intensely focused on the weapons stockpiles of each other. The United States and Soviet Union monitored closely the levels of ballistic missile and nuclear warheads each were developing in an effort to gain and maintain a first strike capability. The fewer missiles/warheads the Soviet Union possessed *relative to the United States*, the logic dictated, the more likely the United States could launch a first strike attack destroying a majority of the Soviet's offensive weaponry and therefore limiting the ability for a Soviet retaliation (and vice-versa).[30]

So while military expenditures were no doubt of interest and importance to both the Soviets and Americans, it was the actual numerical counts of missiles of both the United States and Soviet Union relative to one another that were used to determine the other's military capabilities in the context of preventing a first strike capability. An even clearer example of the salience of raw numbers for states involved in arms racing is discussed by Stoll (2006). In his analysis of major power naval arms racing during the nineteenth and twentieth centuries he illustrates concisely how the arming behavior of one state undoubtedly affected the arming decisions of other competitor states:

> "...the American navy made its decisions based on the size of the British navy. And from about the turn of the twentieth century, the British navy set its size based on the size of the German navy. Consider the consequences of this. As the German navy increased in size, the British navy increased in size. This drove the size of the American navy. This, in turn drove the size of the Japanese navy. So indirectly the size of the German navy influences the size of the Japanese navy...In a few cases, a navy did not have as its goal the size of a particular major power, but a more generic major power. The British navy is the best example of

[30] At least some analysts and observers would argue neither the Soviet Union nor the United States ever gained a first strike capability and, as a result, could not reasonably dismiss the potential for mutually assured destruction (MAD) since a preemptive strike would fail to completely disarm the other side.

> this. The goal of the British navy for about the first half of the nineteenth century, was to be as large (or a bit larger) than the next largest navy. Later, its goal was to be as large as the next two biggest navies; the so-called 'two-power standard'" (Stoll, 2006: 7-8).

So, just as weapons have mattered greatly for the major powers of the international system throughout history I argue weapons are just as significant for minor powers concerned with their security and survival. I explain the role and implementation of the weapons stockpile data I use in my empirical analyses later in the research design of chapter four.

Suggestions for Future Arms Race Studies: Diehl and Crescenzi (1998)

I draw attention here to a particularly relevant article published by Diehl and Crescenzi in 1998 cited just earlier. In this piece both authors recognized an ongoing debate over much of the past arms race research as well as how best to move forward with new studies. In an effort to identify some of the more important concerns and challenges that might face scholars hoping to contribute to the body of quantitative arms race and conflict literature in the future Diehl and Crescenzi (1998) offered several specific ways through which future studies could improve scholars' understanding of the effects of arms races on international conflict. Their suggestions for how future studies should be crafted are important because many of them are related to the decisions and strategies I use throughout this dissertation in my analysis of arms racing and militarized conflict. Below I review some of Diehl and Crescenzi's (1998) more critical proposals so

that readers may reflect upon and reference these as they progress through the dissertation.

One of the biggest concerns voiced by the authors relates to the propensity for most arms race studies to focus exclusively on conflict escalation as opposed to conflict *onset.* In simplest terms, the problem with such a research design is that while it may inform us about how arms races either increase or decrease the intensity of an already ongoing conflict these studies do nothing to uncover the relationship between arms races and the likelihood of militarized conflict starting in the first place. Hence, they believe future studies can contribute by analyzing whether arms races heighten or lessen the probability that militarized conflict will *begin* between a pair of competing states. As I have made clear, understating the relationship between arms races and conflict onset is focus of this dissertation.

Besides focusing on conflict escalation, the authors believe a majority of previous studies have been satisfied with analyzing only the major powers of the system. Although properly understanding the arming behavior and conflict propensity of the most powerful states in the system will always be vital Diehl and Crescenzi (1998) argue minor powers continue to play an increasingly pertinent role in the international system. Furthermore, they believe the theoretical approaches that suggest arms races incite conflict amongst major powers are equally suited to explaining the role of arms races amongst minor powers and thus there is not a unique 'barrier' to studying the small states of the system. In addition, since minor powers compose a majority of the states in the international system they provide a larger population over which to

empirically test theories of arms racing and conflict therefore lessening the chance that results will be skewed due to a relatively small-N (as is the case with studies using only major powers). In this dissertation I analyze most of the system's minor powers located across three distinct geographical regions.

A third recommendation made involves the importance of using multivariate models. As most scholars will understand, the use of multivariate statistical models can help guard against omitted variable bias – that is, the possibility that some alternative theoretical explanation(s) is actually driving the empirical results. The decision (and ability) to use multivariate models is less of an issue today than at the time Diehl and Crescenzi (1998) published their article; however, scholars now realize using many control variables has the potential to produce statistical results just as biased and inaccurate as simple bivariate estimations (I discuss this more in later chapters). As a result, I construct my multivariate models using two specific control variables that are associated not just with conflict onset but also perhaps the arms race variable itself. Doing so provides a robust test of my primary independent variable: the presence of an arms race.

The recommendation made by Diehl and Crescenzi (1998) perhaps most central to this dissertation is their belief future arms race studies should abandon military expenditure data in favor of *weapons stockpile* data. A majority of previous quantitative arms race studies have relied heavily upon expenditure data as the primary measure of whether states are involved in an arms race. Although a reasonable approach, the authors argue there are in fact a host of problems associated with such expenditure

data (as I discussed earlier) such as the inability to determine whether states are reporting the correct figures and problems related to currency exchange rates temporally and cross-sectionally (across time and countries). Wherever possible, they urge, scholars should use the actual weapons stockpiles of states as the primary measure of whether militaries are expanding rapidly over time since states are concerned about tangible arms and not arms budgets (Diehl and Crescenzi, 1998). One of my primary contributions in this dissertation, hence, is the comprehensive use of weapons stockpile data organized along three broad types of arms (ground, air, and sea) to analyze arms races between states.

Each of the suggestions made by Diehl and Crescenzi (1998) above are important in their own right and I believe represent valuable insight into how quantitative arms race research might best proceed. As a result, it may be useful for readers to keep in mind the suggestions of Diehl and Crescenzi as a reference point for understanding and comparing to the decisions I make throughout this dissertation. In the final chapter of this dissertation I revisit their important piece as it anchors a large section recapitulating what has been accomplished. I draw out each of their main suggestions in more detail and offer summaries of how my own research has responded to each of their points.

2.4 Dissertation Contributions and Research Goals

I position my research as a logical next step in the quantitative arms racing and conflict research tradition. My research is a large-N analysis of the relationship between arms racing and international conflict. In broadest terms the goal is to provide new

empirical evidence that can help illuminate further our collective understanding of international conflict and under what conditions it is likely to occur. To do so, however, necessitates a clear definition and scientific operationalization of the primary explanatory variable – the dyadic arms race – as well as a logical theory explaining how arms racing can increase the probability for militarized conflict.

This is important because increased militarization and arms racing have been conspicuous features of the international political arena and many political scientists continue to view arming and arms racing as common behavior for sovereign states operating in the international system: "The quest for military power and its employment as a tool of national purpose have long been deemed among the principal activities of a state, and indeed the ability to employ military force is often considered a central defining property of an independent state" (Mullins, 1987: 1).

The above quote does not reference arms racing specifically but it does allude to the incentives states have to arm themselves. The literature review earlier showed how some scholars have attempted to conceptualize arms racing and its role in international relations and interstate conflict. The theory in chapter three that follows specifies the how the decisions that leaders make in the face of contentious and salient issues can often bring about dangerous arms races and increase the probability of interstate conflict. Yet, the central question persists: given an appropriate model of arms racing what is the impact of arms racing upon the onset of international conflict?

The steps-to-war theoretical framework I present in chapter three suggests (1) states are often in contention with one another over issues, (2) the decisions leaders

make can quickly lead their states into dangerous arms races and (3) arms racing is best understood as primarily an interactive process driven by each state's reaction to the other's arms increases as well as their respective grievances over salient issues. As I have reviewed in this chapter the empirical record thus far has shown to varying degrees a generally positive association between arms racing and the likelihood of observing international conflict. However, I offer new empirical support of an important theory of arms racing and conflict based on what I believe to be an improved conceptualization and measure of arms racing.

To summarize, I argue previous studies have either relied too heavily upon defense expenditure data to model an arms race – thus ignoring the grievances and contentious issue component altogether – or have attempted to analyze arms racing and conflict by using states already involved in some form of ongoing international conflict to then predict more international conflict – problematic from a social scientific methodological standpoint. Furthermore, the empirical evidence from previous studies suggests a positive relationship between arms racing and international conflict but to significantly different degrees. As well, most of these studies were conducted primarily with cases involving major powers and interstate war.[31] The inconsistent empirical record is likely due to the absence of a widely adopted arms race model as well as a general lack of theoretical development by much of the empirical works cited in this chapter and throughout my research.[32]

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[31] Though Sample (2002) did perform an analysis involving minor power and mixed dyads.

[32] Recall Sample's (1998) claim that the most important way forward for arms race scholars might be through theoretical development.

Hence, I argue this dissertation offers progress on all fronts: first, a theoretical orientation grounded in the issue based approach to international relations as well as the broader steps-to-war theoretical framework guides the expectation that arms racing leads states towards dangerous conflict; second, an arms race model defined by a contentious relationship, mutual increases in arms *stockpiles* (not expenditures), and developed over an extended period of time produces an accurate and generally applicable conception of the arms race; and third, an explicit focus on dyadic arms racing and conflict amongst *minor powers* provides a clear set of cases over which to test the theoretical claims. In attempting to move the literature forward I intend to therefore provide a much clearer understanding of international conflict through a better conceptualization of arms racing and I believe my empirical results suggest dyadic arms racing to be an additional 'correlate of conflict'.

Chapter 3

A Linkage Between Arms Racing and Conflict

3.1 Introduction

This chapter presents the theoretical foundations linking arms racing to the onset of international conflict as suggested by the steps-to-war theory. The steps-to-war research program is the appropriate theoretical framework for my study because (among other reasons) it builds directly off of the issue based approach to international relations. After establishing the centrality of issues I present the step-to-war theory as outlined by Vasquez (1993) and Senese and Vasquez (2008). The remaining portion of this chapter reemphasizes how the steps-to-war theory provides a more systematic and accurate account of how states become involved in militarized conflict especially during arms races.

As I have discussed to this point, beyond the recent slowdown of quantitative research and the apparent lack of empirical consistency in earlier studies the arms race literature has also suffered (perhaps more acutely) at the theoretical level. The lack of a strong, consistent theory debilitates the researcher's ability to credibly defend a set of empirical results while inviting detractors to dismiss the outcomes as either wrong or

attributable to some other theory. Sample (1998b) expresses this sentiment clearly in noting "Perhaps the most important step forward will be theoretical. There needs to be more thorough consideration of *why* military buildups might lead to conflict in light of what we do know about escalation processes" (125).

Given this, the first and most foundational part of my theoretical approach is the importance of *issues* for states and their international relations with one another. As I have discussed, there is a strong theoretical and empirical record suggesting a majority of the hostility, conflict, and war between states can be traced to the salience of issues in international relations. The presence of important issues of contention between states causes them to develop aggressive or fearful relationships with one another which can lead quickly to military buildups. Most importantly, I make the assumption the antagonism felt by a pair of states towards one another drives the arms race and is the result of grievances over some issue/issues. The steps-to-war theory begins by emphasizing the role of contentious issues in driving the relationships states have with one another.

3.2 The Steps to War

The steps-to-war theory (Vasquez, 1993; Senese and Vasquez, 2008) remains a highly influential account of the processes that lead states into militarized conflict with one another. The power of this theoretical approach is that it does not purport to identify the specific necessary conditions for interstate war but rather delineates a series of steps that will make war more (as opposed to less) likely. Understanding these

steps therefore makes it easier for scholars and policy makers alike to recognize the types of behaviors and strategies that if left unchecked are likely to lead states into conflict with one another. The steps-to-war theory itself continues with the issue based approach to international relations since a foundational assumption of the steps-to-war is that issues drive international politics and are the starting point along the path to war between states. I cover the role of issues in the context of the steps-to-war theory briefly below. I then lay out the specific steps-to-war as identified in Vasquez (1993) and Senese and Vasquez (2008) so that readers may understand how arms races – one of the steps-to-war – increase the probability of militarized conflict amongst states engaged in such competitions.

The Rise of Security Issues

A critical assumption made by the steps-to-war authors is although not all issues end in war, all wars are the result of salient issues. I note here that since arms races are one of the several steps-to-war then arms races are by definition the result of contentious issues; this theoretical reality is consistent with much of my earlier arguments about how contention and tension drives the arming patterns of states and therefore arms races cannot occur between states where no contentious issues exist. Returning to the broader argument, the steps-to-war theory highlights the role of issues between states as Vasquez (1993) states clearly "All wars begin with issues" (124).

The role of issues are important to the extent they may threaten the security of leaders and their states. In this regard, there are indeed a multitude of issues that can

do just this: diplomatic, economic, and issues related to the military policies of states are all potentially incendiary policy areas over which states might develop fears and concerns over their security.[33] What is important to understand is all types of issues provide opportunities for policy makers and leaders of states to make decisions about how best to resolve such salient issues. Senese and Vasquez (2008) believe how a state "...handles issues between itself and those that contend with it..." (13) is a critically important foreign policy decision that at the very outset can set a state or states along the path to war.

Unfortunately, the presence of salient issues all too often provides an opportunity for state leaders to test the resolve of one another (Vasquez, 1993; Maoz, 1983; Leng, 1980). Leaders engage in coercive behavior and threats because they believe it is these types of behaviors that are most likely to credibly signal to opponents that a state is willing use its own capabilities – force, if need be – in order to maintain a certain status quo over an issue in play or to change and settle the issue in its own favor. In other words, "...actors believe that victory is most likely to be associated with some demonstration of resolve..." (Vasquez, 1993: 158). Instead, however, the coercive behavior heightens the threat perception of those involved and encourages actors to pursue certain *realpolitik* strategies in the context of some disputed issue. Thus begins the interactive process referred to as the steps-to-war.

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[33] Of course, most readers familiar with the steps-to-war research program know that territorial issues have been suggested theoretically and supported empirically as those issues most likely to lead states down the path to militarized conflict.

Components of The Steps to War: Realpolitik Strategies

The steps-to-war theory continues to be an important theoretical framework because it is a parsimonious account that highlights the role of issues and several specific strategies states often pursue that increase the probability of militarized conflict. Vasquez and Valeriano (2010) reiterate this point succinctly:

> "The steps-to-war explanation assumes that it is not just that certain issues or grievances, like territorial issues, produce war, but how they are handled that is critical. Wars arise not only because of goals that are worth fighting over, but because certain processes that states engage in make war likely. The steps-to-war explanation is useful because it specifies in detail what those processes are" (10).

Thus, when contentious issues arise between states it is the *decisions* (which I discuss in more detail later) each state makes about how to deal with their issues that steers them either towards or away from conflict. When states choose to pursue specific *realpolitik* behaviors and strategies then the march towards war has begun. Such *realpolitik* strategies constitute the steps-to-war and they are broadly defined as: hardliners using power politics and coercive threats, alliance making, and arms races.

Power politics behavior, alliance formation, and arms races are the unique steps that make militarized conflict between states more likely. Before discussing each step in more detail, it is useful to recognize at least two other important theoretical assumptions constituting the steps-to-war theory. First, Vasquez (1993) explicitly constructs the steps-to-war theory as an *interactive process of events*. This means the steps-to-war are driven by the interactive and reactive decisions of states over time and *not by systemic conditions* (as realists would argue). This is an important assumption because it reiterates a point the authors make (and that I have highlighted earlier)

throughout the steps-to-war research program which is the assumption by realists that foreign policy is a constant struggle for power when, in fact, this is not the case.

There is not constant struggle as the systemic theory of realism predicts; rather, states become embroiled in disputes and crises only to the extent salient issues are present (Senese and Vasquez, 2008). Since these issues vary over time and by issue type, for example, militarized conflict is driven by decisions made at the state level about how states will interact with one another to settle their outstanding issues. The decisions and subsequent interactions of states – not the structure of the system – therefore determine whether war becomes more or less likely; hence, if states choose to pursue *realpolitik* strategies such as power politics, alliance making, and arms races then militarized conflict becomes more likely. However, if states can avoid such strategies then the prospects for peace increase dramatically regardless of systemic conditions.

A second important assumption to highlight involves the sequencing of the steps-to-war themselves. Part of the broad explanatory power of the steps-to-war theory stems from the fact that although each of the steps can occur in various orders the impact on the probability of conflict always remains positive. Senese and Vasquez (2008) address this directly:

> "The language of steps implies a sequence of actions or even transitions across phases...What is important to keep in mind...is that the presence of more than one step, regardless of its order, results in an increase in the probability of war. What is crucial is not the sequence of the steps, but that they are mutually reinforcing. Alliances may precede or follow military buildups, and militarized disputes are likely to punctuate the entire relationship, thereby occurring before and after certain practices are adopted; however each increases the risk of war" (23).

The authors reemphasize that contentious issues are, of course, always the very first component of the steps-to-war theory. However, once states choose to adopt *realpolitik* strategies to deal with their issues then power politics behavior, alliances, and arms races must not occur in any specific order. What matters theoretically is the presence of any and all strategies means the likelihood of militarized conflict becomes higher than otherwise would be expected.

I draw attention to this feature of the steps-to-war theory because it is relevant to the overall research goal of this dissertation. Recall my primary interest is the relationship between arms racing and the onset of militarized conflict. As I have just reviewed, each of the steps-to-war components is theorized to have independent and positive effects upon the likelihood of militarized conflict regardless of sequencing. This means I can 'cleanly' test the relationship between arms races and conflict since the steps-to-war theory assumes a direct relationship between both of these variables despite the presence of the other steps-to-war or their chronological sequencing. With this in mind, I now present each of the steps-to-war.

Power Politics and Domestic Actors

An important component of the steps-to-war theory is the role of domestic political leaders. The leaders of states make the decisions that will either heighten or lessen the prospects for conflict. They are the actors that drive the most crucial interactions between states involved in a crisis over some contentious issue and as I have noted interaction is a key concept in the steps-to-war theoretical approach.

Domestic leaders have a direct effect on the severity of a crisis and their decisions at the domestic political level influence the actions and decisions made by opponents. Vasquez (1993) identifies two distinct domestic political actors that through their actions can determine whether war becomes more or less likely: accommodationists and hard-liners.

Accommodationist leaders are those who for various personal reasons and dispositions are wholly opposed to the use of force as a means of conducting policy or resolving outstanding issues. Accommodationists therefore pursue foreign policies that will steer their states away from warfare. To do so, they often favor the use of peaceful bargaining, negotiations, and compromise over salient issues. Furthermore, accommodationist leaders are likely to be active proponents of the creation of rules and norms of behavior that can be used to guide international political interactions in a peaceful manner. Ultimately, accommodationists will avoid inflammatory displays of resolve or threats of force and will seek to settle the issue at hand through peaceful and mutually acceptable means (Vasquez, 1993; Valeriano, 2003).

Hard-liners employ opposite political strategies than do accommodationists. Hard-liner domestic leaders have personal predispositions that tend to *favor* strategies of non-compromising and strong-arm negotiation tactics when dealing with adversaries. Above all, these types of domestic political leaders actually prefer to signal their resolve and commitment to use force as they believe threats, coercion, and military engagements are all effective and useful foreign policy tools that can help settle salient

issues in their own favor. Indeed, hard-liners view the use of force as a relatively simple strategy for resolving issues with competitors (Vasquez, 1993).

The problem according to the steps-to-war theory is hard-liners tend to dominate crisis situations. That is, when security issues arise between states it is hard-line leaders that tend to thrive in such situations; furthermore, once hard-liners have established political control they are instrumental in breeding more domestic political hard-line leaders. Hard-liners in power are likely to be in constant disagreement with accommodationist policy makers. Due to the nature of hard-line political leaders, they are also much more likely to shape the political discourse of the moment by suppressing accommodationist pleas for prudence and restraint and instead suggesting and promoting inflammatory policies of non-compromise and direct threats to use force against an opponent. In the end, hard-line political leaders are risk-acceptant in the face of potential war and "...once hard-liners are in power, or are highly influential in the domestic environment, power politics practices will be favored over other practices" (Vasquez, 1993: 207).

Thus, hard-liners increase the probability of war. Domestically, they foster an image of their opponent that is hostile and threatening. They perpetuate and use this hostility and negative cognitive perceptions of their competitor to mobilize the citizenry for potential conflict. Hard-line tactics on both sides of a crisis therefore feed on one another and this interactive process escalates the situation closer towards war. Most importantly, however, hard-liners use power-politics tactics and adopt the *realpolitik*

strategies that make militarized conflict imminent. These *realpolitik* strategies are alliance formation and arms races and they are the heart of the steps-to-war theory.

Alliances

Alliance formation is believed to be one of the major steps-to-war (Vasquez, 1993). The steps-to-war theory identifies alliance formation as one possible policy choice states can make in the face of ongoing security issues. Although the decision to pursue and form alliances is borne out of the realist culture of war alliances themselves are not the inevitable products of the anarchic international system as realism assumes. Instead, they are but one strategy available to the leaders of states and the decision to form alliances can vary over time and by issue. Leaders thus choose to create alliances because the realist culture of war suggests they do so in order to deter external threats. Unfortunately, "Alliances do not prevent war or promote peace; instead, they are associated with war" (Vasquez, 1993: 159). The steps-to-war provides strong theoretical reasoning for this.

First, the steps-to-war emphasizes that the path towards militarized conflict involves interactive processes such as alliance formation. The central problem is realist doctrine encourages states to form alliances in an effort to deter their external threats. As a result, a leader dealing with some salient issue will attempt to forge alliances with other states. The leader does this under the assumption that building up alliances partners is a direct means to increase the security of the state. What the leader fails to understand is the very presence of some ongoing contentious issue/s means some

significant amount of hostility and negativity is already in effect between both states. The opposition state therefore interprets the alliance as a direct threat to its own security and not as a deterrent strategy and responds similarly by pursuing and cementing counter-alliances with its own set of states.

The interactive process creates two sets of hostile alliances. By forming separate alliance blocs each state has successfully offset the advantages of its competitor's alliance but at the sake of decreased security. Now, both states are less secure, more (rather than less) threatened by one another, and the overall destructive capability of both sides has increased dramatically. Suddenly, the decisions to form alliances and counter-alliances have moved both states farther from deterrence and peace and closer to preparations for conflict:

> "A counter-alliance can offset all, if not most, of the capability advantages created by the initial alliance. This eliminates the possibility of alliances acting as a kind of preventative (or "deterrent") of war through the marshaling of overwhelming power. Instead, it increases insecurity, because even if the alliances keep the relative balance the same, the absolute threat, in terms of the destructive power facing each side, has gone up. This can lead to a scramble for more allies which promotes an atmosphere that polarizes the system...alliance behavior has subtlely shifted from a focus on war prevention to preparation-for-war-if-it-comes" (Vasquez, 1993: 166-167).

In addition to alliances increasing the probability of militarized conflict the steps-to-war also argues that the severity and longevity and any subsequent conflicts are likely to be much more intense and protracted. This is because alliances by their very nature involve more states than would otherwise be present in a dyadic dispute. The result is the potential for war to spread and persist. Hence, the steps-to-war theoretical approach shows clearly how the *realpolitik* strategy of alliances very quickly replaces

deterrence with insecurity and crisis escalation. Leaders form alliances because the realist tradition suggests they do so in order to deter threats. The actual outcome, however, is a dangerous interaction where states rapidly find themselves with more destructive power but with less security and on the threshold of militarized violence.

Arms Races

In the midst of domestic hard-liners and alliance formation arms races remain another major step-to-war states often take during an ongoing crisis. Arms races, like the other steps-to-war, are the product of salient and contentious issues between states. Just as domestic political leaders (hard-liners) adopt *realpolitik* strategies in their pursuit of interstate alliances so too do they exploit the threats and image of the enemy to begin increasing their state's military power.[34] This encourages the opposing state to react similarly and begin increasing its own military capabilities. Given this dynamic, arms races are perhaps the most pernicious representation of the interactive nature of the steps-to-war model. Indeed, in discussing the nature and war-proneness of each of the steps-to-war Senese and Vasquez (2008) suggest "...if one has to choose on the basis of the theory, arms racing would be seen as slightly more dangerous, because involvement in an arms race might be perceived as being at the top rung of the escalation ladder..." (27).

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[34] For example, Vasquez (1993) notes "...decision makers are unlikely to get domestic support without some concrete manifestation of the threat posed by the rival...In order to generate the necessary domestic mobilization for arms races – such as increased taxes, a shift in resources and spending, and the adoption of some form of conscription – leaders often exaggerate the external threat" (178).

This is because arms races in the context of some crisis over an issue cannot be interpreted as anything else but threatening to both parties involved. Once again, Vasquez (1993) and Senese and Vasquez (2008) argue the realist tradition of international politics consistently presents mutual arming as a strategy that can help one state deter the dangerous and opportunistic intentions of another. The steps-to-war theory recognizes the logic of this strategy to be contained primarily within the security dilemma (Herz, 1950; Schelling and Halperin, 1961; Jervis, 1978). The security dilemma – or spiral model – assumes that states involved in a crisis wish to increase their security. Rational decision making informs domestic leaders that to increase their security they should build up their military forces.

An increase in security by one state, however, means a decrease in the security of the opposing state by definition of zero-sum security.[35] Thus, both states engage in repeated rounds of arming and an arms race is born. It is here where the mutual quest for security and deterrence is betrayed. The arms race fails to provide security for both parties and instead creates a reality in which both sides must now continue to arm lest they fall behind in military capability and risk attack. Yet, as the arms race continues each decision to arm is seen as another preparation for war. Given that (1) some salient, contentious issue continues to exist (2) domestic hard-liners are using power politics to create a "feverish pitch" (Vasquez, 1993: 199) and (3) alliances have been formed or are in the process of being solidified then the arms race itself appears to the

[35] The term zero-sum security I use here is analogous to the more commonly understood concept of zero-sum power. Realists often describe one state's gain in power as an equal loss in power for another state: thus, a zero-sum outcome. Similarly, any increase in security for one state (such as when it acquires more weapons) produces an equally large decrease in security for another competitor state.

leaders of both states to be simply another step-to-war. The step-to-war theory concludes clearly that:

> "...these practices do not produce peace and security, as realists maintain, but increased insecurity, coercion, and entanglement in a process and series of steps that may lead to war. Each step leads decision makers further and further into a trap (both globally and domestically) where they have little choice but to fight" (Vasquez, 1993: 196).

3.3 Why The Steps-to-War?

The explanatory power of the steps-to-war is therefore the product of two general factors. First, the steps-to-war theory places salient issues at the forefront of international politics. Unlike the realist paradigm, states are not in a perpetual struggle for power and security and conflict and war are not inevitable outcomes of the anarchic international system. Rather, states only become involved in disputes and crises with one another to the extent there are highly salient and contentious issues present. Since the presence of such issues can vary, peace can quite often be the status-quo for states in the international system; only when contentious issues are present is there some probability that states will start down the steps-to-war. This is an important feature of the theory and it is consistent with my conceptualization of arms races that assumes arms racing can occur only between states where some contentious issue or issues is present.

Besides the role of issues, the true power of the steps-to-war theory is it assumes leaders and states have different *choices* in handling international crises. Relationships between states are not simply defined by the structure of the

international system but by the *decisions* that leaders make in dealing with salient issues. It is in this respect that Vasquez (1993) and Senese and Vasquez (2008) are adamant that leaders always have a set of choices – a set of foreign policies – that may be used to deal with some contentious issue. In other words, "The steps-to-war, then, must be viewed as foreign policy *decisions*..." (Vasquez, 1993: 200).

Unfortunately, *realpolitik* is one such available foreign policy (Vasquez, 1993). As a result, the decisions leaders make are all too often those utilizing *realpolitik* strategies. This, according to the steps-to-war, is because the realist culture of decision making suggests leaders should use power politics in their dealings with other states, form alliances, and build up their militaries in order to discourage external threats. Instead of providing deterrence and increasing security, however, power politics and realist strategies set states along the pathway to militarized conflict. Thus, leaders always have the ability to choose policies that will promote peace but instead regularly find themselves adopting the very strategies and behaviors popularized by the realist tradition that lead states towards war.[36]

One of the central steps-to-war is the decision to engage in arms racing. Arms races and their impact on the likelihood of militarized conflict between states is the central focus of this dissertation. As seen in this chapter, decisions to increase military capabilities leads states into a hostile spiral of arms competition and increased mutual hostility. As both states perceive a loss of security and as the arms races continues the net effect is an overall increase in military capabilities for both states. The continually

[36] Senese and Vasquez (2008) argue clearly that "...realist folklore can be seen as a set of constructed rules that guide diplomats and leaders" (25).

increasing military capabilities are interpreted as preparations for war. Thus, for these reasons the steps-to-war suggests arms races increase the probability of militarized conflict.

More specifically, arms races are dangerous and make conflict more likely simply because they "...might encourage a preemptive strike" (Senese and Vasquez, 2008: 27). Since no two states involved in an arms race are likely to have the exact same military capability at any given time there is a continually shifting window of opportunity for one state to utilize its military advantage over its competitor and initiate militarized conflict on its own terms. Morrow (1989) advances this same argument in his explanation of how arms races lead to war noting that "Swings in military superiority between the racing powers provoked by the race create a motivation for war to exploit temporary advantages" (500).[37] Therefore, the logic of the steps-to-war theory produces the following central hypothesis I seek to test in the remainder of this dissertation:

Hypothesis 1: *The presence of an arms race increases the likelihood of international conflict.*

My research goal, therefore, is not to provide a unique theoretical contribution to the field of international conflict. In this dissertation I will instead provide new empirical tests of an established theory of interstate conflict. My analysis of arms racing

[37] Gleditsch and Njolstad (1990) echo this logic in their claim that "Armaments increase the risks of war, whether by making their possessors more belligerent, more reckless, or more likely to become the targets of pre-emptive wars, or by making 'war by accident' more probable" (352).

and the onset of militarized conflict will emphasize the necessity of contentious issues between states and incorporates the use of actual weapons stockpiles as the primary measure of arms racing; the role of contentious issues and the use of weapons stockpiles are two factors that have been largely absent from the majority of previous arms race studies. Hence, the steps-to-war theory suggests a positive relationship between arms racing and militarized conflict and in the following chapters I provide new and important empirical results in support of this relationship.

3.4 *Moving Forward*

I have presented a theoretical framework linking arms racing to conflict as contained within the logic of the steps-to-war research program. The theoretical arguments contain important concepts and ideas which need to be defined and operationalized in order to be implemented for empirical testing and evaluation. The following chapter isolates the relevant theoretical concepts and provides definitions and scientific operationalizations and measurements for each variable. Specifically, I develop a unique conceptual model of arms racing utilizing the three necessary conditions from the definition of an arms race used throughout this dissertation. I explain the data used to measure the primary explanatory variable, arms racing, and the dependent variable, international conflict, as well as the research design and methodology used to evaluate the central hypothesis developed above.

Chapter 4

Designing a Statistical Model and Evaluation

4.1 Introduction

This chapter is a discussion of the overall research design of this dissertation. It begins with a section describing the decision to conduct a regional analysis of minor power arms racing and conflict. I then begin the first portion of my research design and explain how I evaluate Hypothesis 1 – the relationship between arms racing and conflict onset – which is the central research question of this dissertation. This section of the chapter proceeds with a description of the variables including the model of arms racing developed for this dissertation and the measurements and data used to test Hypothesis 1. I conclude with an overview of the methodological techniques I employ to evaluate my statistical models in the three empirical chapters that follow this chapter.

4.2 Justifying the Regional Approach

Portions of earlier chapters discussed briefly why a regional analysis is the preferred approach for this dissertation but my decision warrants further explanation here. The first reason is fairly straightforward and stems from a *de facto* geographic

reality: this study is about minor power arms racing and a significant portion of the system's minor powers are located within the three regions of Latin America, the Middle East, and Africa. This geographical arrangement means minor powers are really only ever concerned with other regionally located minor powers because they simply cannot exert influence very far beyond their own borders. There is an intuitive explanation for why this is the case and this reasoning is an important justification for the regional approach I adopt in my empirical analyses later in this dissertation.

Minor Powers as Constrained States

Given the geographical reality discussed above that faces most minor powers the true reason to study minor powers regionally is the fact that minor powers are primarily concerned with the immediate area around them *as a consequence of their relatively constrained power* and can therefore only ever really affect and influence events within this limited area. Even with the global financial crisis of 2008 a recent report by the Middle Eastern news channel Al Arabiya (February, 2009) reveals the massive amounts of weapons the Gulf States continue to develop and purchase. Al Arabiya indeed notes "The energy-rich Gulf region has been affected by the collapse of world oil prices from nearly $150 a barrel last July to below $40 a barrel...But concerns among Gulf countries, especially Saudi Arabia, over non-Arab power in the face of Iran's rising influence in the region is fueling an arms race" (Al Arabiya, 2009).

This statement is an excellent example of the regional concerns minor powers are most preoccupied with. Al Arabiya's observation illustrates how Iran's actions are

perceived by and affect the behavior of Saudi Arabia, but the quotation is meaningful because it also draws attention to the potential for Iran's actions to extend beyond Saudi Arabia and impact other Middle East minor powers, or the Gulf region itself, as Al Arabiya claims. This is the essence of the regional focus used in this dissertation: what one state does in its region can and often does impact another state – or multiple other states – in the region.

That minor powers are concerned with and able to interact primarily with other minor powers is borne out empirically, as well. In their comprehensive study of international rivalry and interstate war, Diehl and Goertz (2000) provide a typology of international rivalry from 1816-1992 based on militarized interstate dispute occurrence over certain spans of time. Of the three categories of international rivalry they develop, the enduring rivalry is most contentious and involves at least six MIDs in the span of twenty years: as a percentage, fully 52% of their enduring rivalries are between two minor powers. The two less disputatious categories, isolated and proto rivalries, are composed of 46% and 45% minor power dyads, respectively.[38] Their analysis shows the most intense form of international rivalry, the enduring rivalry, is composed of over 50% minor power dyads, while the remaining two categories contain nearly 50% minor power dyads.[39] Thompson (2001), another important contributor to the rivalry

[38] See Diehl and Goertz (2000) for operational definitions of the isolated and proto rivalries.
[39] Major-major and major-minor dyads account for 18% and 30% of enduring rivalries, respectively, suggesting again that minor power dyads are responsible for the majority of highly disputatious rivalries.

literature, produces a list of one hundred seventy four strategic rivals[40] from 1816-1999 of which *74%* are minor power dyads.

These percentages provide strong evidence that minor powers are primarily interacting with other minor powers, but are such critical interactions involving rivalry and conflict occurring *regionally* as I have proposed throughout this dissertation? Indeed, a closer examination of the rivalry datasets from both Diehl and Goertz (2000) and Thompson (2001) suggests minor powers are in fact interacting with other regionally located, neighboring minor powers. An analysis of the thirty three minor power enduring rivalries from Diehl and Goertz shows only *one* minor power rivalry to be non-regionally located, the Spain-Morocco rivalry (though both are only 8.1 miles apart at their closest point).[41]

Of the one hundred twenty seven minor power rivalries defined by Thompson only *two* involve minor powers not located within the same region, the Spain-Morocco rivalry and the Indonesia-Netherlands rivalry. The rivalry literature provides additional compelling empirical support to study minor powers within the distinct regions in which they operate. If minor powers are engaging in rivalry and conflict with one another at such high rates within their own geographic region then it is plausible that they engage in arms racing with their regional neighbors, as well.

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[40] His list of 174 strategic rivals emerges "...from an identification process predicated on a rivalry definition that combines competitor status, threat perception, and enemy status and focuses on the extraction of information about decision-maker perceptions from historical analyses" (568).

[41] For my analysis of these rivalry datasets I used commonly accepted notions of geographic regions such as Latin America, the Middle East, and Africa, for example. In addition, I identified regions by COW nation numbers.

These examples show how minor powers are significantly concerned with and involved with other minor powers, especially at the regional level. Pooling minor powers together across regions would contradict the empirical reality just presented. What would a Syria-Paraguay or Morocco-Chile dyad tell us about arms racing and international conflict between minor powers? Would there even be the slightest reason to expect such pairs of states to engage one another in conflict or compete with each other in the context of arms racing? Of course not and this is because Syria is primarily concerned with and *only capable* of dealing with her immediate neighbors and regional cohorts. The same is true for Paraguay, Morocco, and Chile.

Therefore, a minor power located in Latin America (for example) must view each of its regional neighbors as likely adversaries. Chile must decide whether Bolivian declarations of pursuing naval power or fortifications of ground forces are perhaps aimed at future plans for reclaiming a Bolivian Pacific coastline from Chile (Romero, 2006).[42] Grouping all of the states together over time – conducting a pooled time series analysis – would therefore muddle the dynamic outlined above; Bolivian grievances and attempts for naval military expansion is likely to influence the arming behavior of other Latin American states at some point in time but should be unrelated to the arming behavior of states located in Africa, for example.

[42] Romero (2006): *Bolivia Reaches For A Slice of the Coast That Got Away*. Available at http://www.nytimes.com/2006/09/24/world/americas/24bolivia.html.

4.3 The Research Design

The following three chapters of this dissertation present the empirical results of my analysis of minor power arms racing and international conflict in three separate regions: the Middle East, Africa, and Latin America. Although each region is covered in a separate empirical chapter the overall research design strategy is consistent for each region. I describe the dependent variable as well as the important control variables included in my empirical model of arms racing and conflict and how each of these variables is measured quantitatively. As well, I explain in detail the model of arms racing I develop and utilize in this dissertation. My model of a dyadic arms race involves three necessary conditions that follow directly from the definition of arms racing defined in chapter one and referenced throughout the dissertation. The following pages discuss the research design decisions and data used to test the central hypothesis of this dissertation:

Hypothesis 1: *The presence of an arms race increases the likelihood of international conflict.*

Dependent Variable: Interstate Conflict

The following sections describe the variables, operationalizations, and data used to evaluate Hypothesis 1 above, the central research question of this dissertation. To begin with, I seek to explain international conflict and use as my dependent variable militarized interstate disputes (MIDs) as developed by the Correlates of War project.

Specifically, the dependent variable I use in my analysis is the onset of militarized disputes between a pair of minor power states in a given region. My unit of analysis is (by region) all non-directed dyads over the temporal domain 1970-2000.

A militarized interstate dispute (MID) is a representation of interstate conflict between a pair of states. Jones, Bremer, and Singer (1996) describe militarized disputes as "...united historical cases in which the threat, display or use of military force short of war by one member state is explicitly directed towards the government, official representative, official forces, property or territory of another state" (168). Thus, the MID dataset represents a variety of interstate relations that range from militarized threats and disputes, military engagement, and interstate war as defined by Singer and Small (1972). The variable itself is a dichotomous measure of the onset of interstate conflict taking the value of 1 if conflict occurs within the dyad during a given year and 0 otherwise.[43]

Conceptualizing Issues

Recall my central theoretical assumption is the presence of contentious issues drives the arming behavior of states. I have argued that such substantive disagreements – contention – over issues are always the first step in the path towards arms racing and, if it happens, conflict. A particularly salient issue can suddenly bring the political worlds of two states together. Sustained contention or disagreement over the issue is then

[43] The dependent variable data as well as data for the control variables used in this dissertation is obtained from Oneal and Russett (2005) who themselves generate the data using EUGene (Bennett and Stam, 2000).

what motivates states to begin arming against one another. This is because the presence of a contentious issue drives the interactions states will have with one another.

As the steps-to-war theory suggests, if states are unable to resolve salient issues between them then their sense of security and mutually held perceptions of one another are likely to suffer. Such disagreement and tension renders arming an attractive policy choice and the continued failure to resolve outstanding issues perpetuates the mutual arming. To be clear, the presence of a contentious issue is not a sufficient condition for arms racing and conflict but it is indeed a necessary condition for the start and maintenance of any arms race. An issue based approach to arms racing thus allows the researcher to understand why states might arm against one another and identify which cases are indeed doing so.

This is a critical component of my approach to arms racing and conflict: it makes little sense to discuss arms racing and the potential for conflict amongst states in which no substantive disagreement or tension exists. This is because identifying pairs of states holding grievances or ill-will towards one another reduces the likelihood of observing false-positives. For example, consider the England-France dyad during the Cold War. By any measure, both states were increasing their arms and militaries significantly over the span of several decades during the Cold War. Yet, no minimally informed person would argue France and England were involved in an arms race against each other and, most importantly, it is clear there was absolutely no chance of militarized conflict between these two states. Obviously, both states were arming against the ongoing Soviet threat

and attempting to mitigate the power of Soviet military expansion by increasing their own arms. An analysis based strictly on the arming patterns of pairs of states, however, would suggest France and England were preparing for militarized conflict with each other even though this was not the case.

Unfortunately, correctly identifying pairs of states where there is some level of tension between them is far more difficult than the above example suggests. The France-England example may seem trivial but the difficulty in observing tension or grievances between states increases dramatically when analyzing pairs of states that are not as obviously friendly as with the France-England example. The problem has been especially acute in previous studies attempting to evaluate the relationship between arms racing and interstate conflict.

As mentioned earlier, one strategy many scholars have employed in an effort to determine which pairs of states have tension and are thus arming against each other has been to select dyads already involved in disputes or crises with one another. Using this technique reassured scholars the increased arming in their selected dyads were actual arms races. For example, the Wallace (1979) and Sample (1998a) studies discussed earlier used pairs of major power states engaged in militarized disputes with each other and analyzed whether the presence of an arms race escalated these disputes to interstate war.

However, given that Wallace's sample contained 99 dispute dyads and Sample's contained 257 dispute dyads the empirical results of both studies therefore explain only the specific dispute cases they chose. This type of research design – analyzing only

cases already involved in conflict – therefore severely limits the generalizability of their results. Additionally, the Wallace and Sample studies are problematic since it is likely the statistical results they obtained were biased since they selected only cases in which conflict was already occurring between dyads. Sample (1998a) is forthright about such problems with the arms racing and conflict research program and summarizes it clearly:

> "By addressing the effect of arming on disputes, we cannot determine whether there were cases in which arming deterred disputes altogether or, alternatively, whether military buildups led to militarized disputes that would not have occurred in their absence. To determine whether arming leads to disputes, it is necessary to overcome certain testing obstacles, including a means of determining whether relations between two states *are sufficiently salient that the arming of one is viewed as relevant by the other* [emphasis added]" (158).

Beyond ignoring the role of issues their strategies produce several common problems associated with preselecting cases to be analyzed. First, by preselecting a sample of dyads based on dispute involvement these studies are automatically constrained in the generalizability of their empirical results.[44] Additionally, selecting dyads already engaged in a type of behavior (conflict) which the investigation is trying to predict (conflict escalation, war) jeopardizes the robustness of any empirical results. Any statistical relationship between arms racing and the escalation of conflict is therefore almost certain to be positively skewed in these studies (and others similarly constructed) because their analyses failed to include dyads in which *no conflict* was present.

[44] If the researcher wished to apply their results to future cases it would need to be shown that any additional cases are very similar to the original samples used.

As I have discussed in earlier chapters, however, issues have been and remain a central theme in the research of some of the most important and influential scholars in international relations. Even though previous arms racing and conflict studies have realized the importance of ensuring pairs of states engaged in high levels of arming are doing so in response to one another they have avoided developing a theoretical approach based on the salience of issues to construct their research designs and empirical models of arms racing and interstate conflict.

Measuring Contentious Issues

Thus, I have argued throughout this dissertation that without contentious issues it makes little sense to discuss arms racing or conflict between states; salient issues provide the political context in which states become concerned about one another and can become involved in arms racing and potentially militarized conflict. I therefore use United Nations General Assembly roll call vote data to measure the extent to which states are in contention with one another over a broad range of issues. The use of UNGA roll call data to understand the interstate relations and policy preferences of states has gained traction with international relations scholars over the past decade (Kim and Russett, 1996; Gartzke, 1998; Voeten, 2000, 2004; Reed et al., 2008).

Theoretically it is important to understand what United Nations General Assembly voting tells us about the relationships between states. I argue that United Nation general assembly roll call votes are reasonable indicators of the overall preferences of states over a wide variety of issues. In a given year a state votes on a

range of international issues. Some issues may be relatively minor while many issues will carry significant international consequences. Furthermore, United Nations General Assembly votes are useful because during a given year states vote on a plethora of *issues* such that an overall policy position (ideal point) can be determined and used to understand one state's general policy preference and world view relative to other states in the international system during that year.

Of critical importance to understand here is that contentious issues between states produce both tension as well as specific voting decisions in the UNGA; however, (although certainly possible) the UN votes may not necessarily be related to the actual issues in contention. What is important is the UN votes themselves can be used as a representation of the disagreements and contention between states. This notion of variation in policy preferences/world views as represented by differences in UN voting is therefore a defensible measure of the *presence of contentious issues between states*.

Beyond the theoretical importance and utility of using General Assembly roll call votes there are additional reasons to use these votes in the context of minor powers and small states. Many agree the United Nations serves as an especially important formal institution where such states have an equal opportunity to vote on issues and concerns that directly affect their standing within the international community.[45] Voting on issues in the United Nations is also important for minor powers because a large proportion of minor power states are unable to maintain embassies or a formal diplomatic presence with every other country in the international community. In

[45] Voting in the UNGA is egalitarian in the sense that a vote by the United States is equal to a vote by Paraguay, for example.

describing the importance of the United Nation General Assembly Voeten (2000) notes "...it is the only forum in which a large number of states meet and vote on a regular basis on issues concerning the international community...studying this interaction over a long period of time and across different issue areas should reveal changes in the behavior of states..." (185-186).

Given my objective, I employ ideal points calculated from United Nations roll-call votes as a measure of whether pairs of states have dissimilar policy preferences over some issue/s. These data are from Reed et al. (2008). In this recent study the authors use raw United Nations roll call data[46] to produce ideal point estimates for each state in the system over the temporal domain 1946-2000. That is, they use the roll-call data to estimate a single dimension of state preferences. Since Reed et al. (2008) is a relatively recent publication and since many readers may not be familiar with their data set I will explain the steps they utilized to construct the ideal point estimates for each state.

The process they use to obtain the ideal points for each state involves several steps. First, to capture as many states as possible in their sample they include any state that voted at least twice in a given year within the General Assembly. The next step is to determine the population of roll call votes to be analyzed. The authors use the strategy employed by Poole and Rosenthal (1997) and exclude all votes in which fewer than 2.5% of the states voted either "yes" or "no". The authors also consider the issue of abstentions and note there is a general lack of agreement amongst scholars about how to interpret the meaning of abstaining. Given the different ways scholars have

[46] See Voeten (2000; 2004) for a comprehensive overview of the characteristics and implementation of United Nations roll call data.

interpreted abstentions, Reed et al. (2008) decide to code abstentions in General Assembly voting as missing values because they are "...interested in only revealed preferences directly associated with decisions on issues" (1208). They argue this is the least controversial strategy to evaluate state preferences since it involves only the actual revealed preferences of states voting in the General Assembly; since their sample is quite large, they believe coding abstentions as missing values does not produce any significant statistical problems.

Having obtained the appropriate sample of states and General Assembly roll-call votes the authors then proceed to estimate the ideal points. The process is somewhat complex and so – as Reed et al. (2008) suggest – I supply a link below to the online appendix containing the exact steps and technical specifications the authors employed in obtaining their ideal point estimates.[47] As a basic overview, after obtaining the ideal point estimates the authors then use Markov Chain Monte Carlo (MCMC) simulation techniques to produce large enough samples from the joint posterior density of the parameters such that summary statistics can be calculated and then used for inference.[48] Therefore, the authors set priors for the ideal points of the United States to "-1" and for Russia (Soviet Union) to "+1" and assign a prior of "0" to all other states as well as "...uniform priors (1.0, -1.0) to the density over the ideal points. These uniform priors have the nice property of constraining ideal points to the interval of 1.0 and -1.0" (Reed et al., 2008: 1209).

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[47] The online appendix containing the exact steps and technical decisions made in generating the ideal points can be found at http://web.utk.edu/~whwang/jopappendix.pdf.

[48] In Bayesian estimation techniques, the joint posterior density refers to the product of the prior density or distribution of a set of parameters and the likelihood.

As a result, the MCMC estimation technique provides an estimate of the posterior distribution and the resulting mean is therefore used as the revealed ideal point for all states in each year of analysis. Hence, the ideal point for any state can be arranged spatially from -1 to +1 along the single dimension of United Nations General Assembly votes. I assume contention or tension between states increases as the distance between their individual ideal points increases while more amiable relationships (preference similarities) are present when ideal points are located closer together. The following explanation details how I classify ideal point distances amongst dyads as either contentious or not.

In order to calculate the distance between states' ideal points and determine whether these distances represent contention I perform the following steps for each dyad in each year:

1. For every dyad in an individual region I obtain an absolute value of the difference between their respective ideal points. For example, if in 1990 one state in a dyad has an ideal point of +0.5 and the other state has an ideal point of -0.5 then the *absolute* Euclidean distance between these two states is +1.0.
2. Using the absolute distance in ideal points for each dyad in each region I then calculate the mean distance from the set of individual dyadic distances for each region. This produces an average Euclidean distance in ideal points for the Middle East, Latin America, and Africa over the period 1970-2000.

3. Having obtained an average ideal point distance for each region I determine that a difference in ideal points for any single regional dyad that is at least one standard deviation higher than the overall mean value *of that region* represents tension between a pair of states.

Therefore, distances between ideal points are used as the primary empirical indicator of whether two states are in contention with one another over some issue or issues. That is, if the distance between two states' ideal points is large enough then there is tension between them and both states are candidates to be involved in an arms race; however, if there is no tension between a pair of states then there can be no arms racing, no matter what the arming pattern of a pair of states turns out to be. Additionally, I reiterate that mean ideal point differences are calculated separately for each of the three regions I analyze. This is an appropriate coding decision since it allows me to determine whether two states in Latin America (for example) are in a high level of contention with one another based on the overall average level of policy divergence in that region.

There are a couple of other important points to make here. First, the authors at the outset performed an analysis of the roll call data in order to gauge the relative heterogeneity of issues over which states are voting. Their analysis lead them to conclude the large number of votes since 1946 are indeed distributed over a similarly large number of issues such that no particular issue (such as Israel or North Korea, for example) dominates the roll call votes. They therefore argue this ensures the final ideal point estimates are not significantly skewed but rather reflect the underlying

preferences of the many states that have had the opportunity to vote in their self interest on a variety of issues in the United Nations General Assembly:

> "States have specific political goals having to do with the extent to which they agree or disagree with other states, and they can pursue those goals in votes that do not pertain specifically to them, or to their allies or enemies. Instead, states use UN votes to express their preferences on issues related to positions taken by blocs of states, and on issues related to ongoing dyadic disagreements" (Reed et al., 2008: 5-6).

In addition, I reemphasize a critical distinction made earlier. The differences in ideal points serve as *indicators* of the underlying tension between states. This tension, however, may not be directly related to the actual issues up for vote in the General Assembly. In other words, it is possible a pair of states is in contention over some specific issue and this issue is indeed up for vote in the General Assembly. It is also possible a pair of states is in contention over some issue or range of issues that are specific to them and *not* up for vote in the General Assembly. Regardless, if two states are systematically voting differently within the General Assembly then this (the difference in their ideal points) is a reasonable indicator of tension and contention over issues between them.

The Explanatory Variable: Arms Racing

The primary explanatory variable is the presence of an arms race. Perhaps most important, however, is the use of military stockpiles categorized as either land, sea, or aerial forces allows for specific types of arms races to be coded. This is an important advantage over the more common use of defense expenditure data. As previously

discussed defense expenditure data is often difficult to compare cross-sectionally (by state) and over time due to an inability to confidently know exactly what constitutes each state's defense expenditures. Furthermore, while it is theoretically possible to disaggregate expenditure data by weapons type this would require a significant amount of work and would ultimately rely upon the availability and quality of individual states' defense expenditure budgeting data. As a result, the majority of large-N statistical studies of arms racing have used a single yearly figure representing the overall defense expenditure of a given state.

While a reasonable approach, using a general defense expenditure figure also glosses over the nuances of arms racing as such data can only be used to code a 'generic' conception of whether an arms race between states is present or not. The use of weapons stockpile data, however, provides a useful increase in precision: over which weapons systems (land, sea, or air) are individual states devoting resources and increasing from year to year? What types of arms races are states involved in with one another? Most importantly, which types of arms races are positively associated with militarized conflict? The use of weapons stockpile data thus provides increased leverage over research related to arms races and their consequences. Using such weapons stockpile data helps transition away from traditional empirical analyses based on expenditure data to more detailed and precise analyses of specific types of arms racing and their individual effects upon conflict.

I measure the size of a state's military using the actual armament stockpiles of the state over the period 1970 through 2000. *The Military Balance* lists in detail the

stockpile figures for a variety of weapons, weapons systems, and military vehicles for all states in the international system. The stockpile reports for each state are organized broadly along land, sea, and air based weapons. From these reference guides I collected data on almost all forms of weapons and combat vehicles over the three general categories of land, sea, and air. Each of these three weapons indices are created by tallying specific weapons as follows (Appendix 4A at the end of this chapter contains the coding manual for this procedure):

1. Land forces: to create a measure of the general ground based weapons of a particular state I tallied together all main battle tanks (MBT), armored infantry vehicles (AIFV), armored personnel carriers (APC), reconnaissance vehicles (RECCE) and all guns or mortars listed as self-propelled (SP).
2. Naval forces: to create a measure of the general naval based weapons of a particular state I tallied together only all destroyers, frigates, and corvettes (Principal Surface Combatants), all missile craft, torpedo craft, and armed patrol craft (Fast Action Combatants).
3. Air forces: to create a measure of the general aerial based weapons of a particular state I tallied together all fighters, fighter ground attack aircraft (FGA), bombers, and all combat helicopters.

These weapons stockpiles categorized as three separate indices (arms variables) are used to determine whether pairs of states are racing one another. Specifically, there must be some larger than normal increase in the arming of each state in the dyad

over a period of time. There are several steps to determine the specific increases in armaments of states over time and whether these increases are abnormally large:

1. I calculate the difference in levels of weapons of a state from time *t-5* and *t*. For example, I subtract the number of naval forces for Brazil in 1991 from its naval forces in 1996, the number of naval forces in 1992 is subtracted from those in 1997, and so on for each year of my analysis. This means the change in weapons for a state are calculated from 1970 to 1975, 1971 to 1976, 1972-1977, and so on such that the change in weapons for all states is calculated for all possible five year windows.
2. This method provides the changes in weapons for each state over any five year window from 1970-2000. For example, there is a numeric figure representing the change in each type of weaponry for Argentina from 1970-1975, 1971-1976, 1972-1977, and so on, as well as for Brazil, Chile, and every other state in the region of Latin America.
3. Next, the individual changes in arms for all states over any five year period are averaged *by region* to produce a numeric figure that is the mean change in weapons for a particular region over the period 1970-2000. To use another example, this means the average five year change in ground weapons for each state in Latin America is added together and averaged to produce a single figure that is the average change in ground weaponry for the entire region of Latin America. This procedure is used to calculate the

mean change in weapons for ground, sea, and aerial forces for each of the three regions analyzed.

4. Using these mean values I set the threshold for racing at 25% higher than the mean value of arms increases. For example, the mean change in air weaponry over any five year period for my sample of Middle Eastern states 1970-2000 is approximately 38%.[49]
5. If tension is present at *t* between two states then I observe whether there is at least one year of simultaneous extraordinary arming (as defined above) between both states between *t* and *t+5*. If so, the arms race variable for that type of armament (land, sea, or air) is coded. For example, if two states are in a contentious relationship in 1980 then I determine whether there is an instance of extraordinary arming between both states during any one year up to 1985. If so, then an arms race is present. This is a reasonable coding decision because the theory does not attempt to predict precisely at which year an arms race should break out; rather, I assume serious contentious issues produce a lagged effect in which tension between states is likely to linger at least for several years afterwards and during which any extraordinary bilateral arms increases should be linked to this tension.

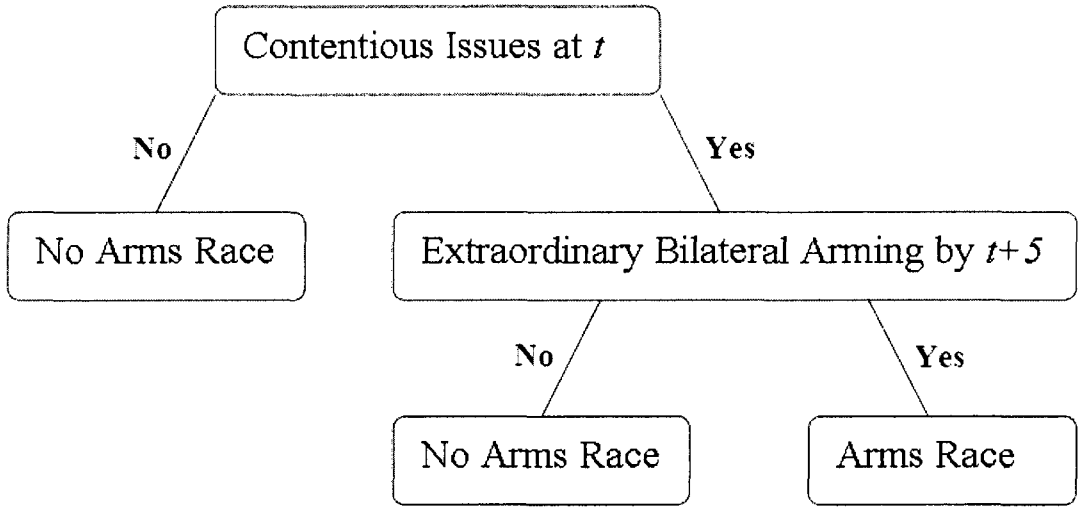
To reiterate, the entire process begins with the presence of contentious issues between states. Only if there is some level of underlying tension present do any subsequent increases in bilateral arming matter. I believe five year windows are long

[49] So, for air weapons, the exact threshold would be .25*.38=.095; adding 9.5% to 38% means the threshold is approximately 48% for a state to be racing.

enough to allow for states to actively and consciously increase their arms stockpiles. This strategy is similar to that found in Senese and Vasquez (2005) who employ a 5 year window in their analysis of militarized interstate dispute escalation to war. In this study the authors evaluate the likelihood of a dispute escalating to war within a five year window. They argue that because war is a process, it takes time to observe whether disputatious relationships develop into interstate war. In the context of arms racing, I am making a similar argument: arming and arms racing takes time to develop, and so I believe five year windows offer an appropriate length of time to observe the presence of contentious issues as well as increases in bilateral arming and to determine whether these arms races are leading states into militarized conflict.

For the purposes of this study, I therefore observe changes in arms as well as tension levels over any five year period of time. The following flow chart simplifies the steps involved in my index construction described above:

Figure 4.1
Charting the Conditions for Arms Racing



Unlike previous studies I do not preselect a set of cases to analyze based on rivalry history or incidences of repeated crises or conflict. Instead, all dyads in a particular region are potential candidates for arms racing. As the flow chart above shows, the very first condition that must be met is the presence of contentious issues between a pair of states. If there is no tension between states, then there can be no arms race between the states; I note again, the lack of contentious issues does not preclude a pair of states from arming increases but if there is a lack of tension I assume that the states' increased arming is *not* directed at each other. However, if there is tension between a pair of states then there must also be some level of extraordinary arming within a certain period of time in order for an arms race to be present. Hence, each of these conditions helps ensure that actual arms races are being identified and not just cases in which states are arming but not against each other or cases where

states are indeed arming against each other but not at high enough levels and within a certain timeframe.

In addition, my use of percentage thresholds as a measure of extraordinary arming over time has a precedent in previous quantitative arms race studies. For example, Wallace (1979) observed whether bilateral defense expenditures increased more than 10% over a ten-year period; Morrow (1989) defined arms races as all cases in which the military expenditures of two states exceeded 4% per year over his various windows of time; and in Gibler et al. (2005) the authors analyze arms races amongst interstate rivals and require at least an 8% increase in the military expenditures (or personnel) by two states in every year of a three-year period. With regards to their 8% threshold the authors note "We do not assume that 8% has any particular significance, but we believe that...this level allows for a sample size that is reasonably large for inference but still small enough to establish interdependence" (Gibler et al., 2005: 138).

Hence, I share their sentiment as I believe my threshold of a 25% increase in weaponry for two states over any five year period is an appropriate measure that is neither too restrictive as to eliminate real cases of arms racing nor too lax as too capture false-positives. Also, it is important to note the specific threshold I use is robust to either higher or lower changes. That is, the empirical results I report and discuss later but for one small exception do not change if a smaller (20%) or larger (30%) threshold is

used to estimate the statistical relationship between arms racing and militarized conflict instead of the original 25% threshold.[50]

The Covariates

Beyond the primary explanatory variable of interest I include two theoretically relevant covariates in the set of statistical models I estimate. Many international relations scholars have informally identified a set of 'usual suspects', or control variables, that should be included in conflict studies empirical models. In her book on reputation and deterrence Anne Sartori (2005) addresses this practice noting: "It has become customary in statistical analyses of international relations to include a number of variables that are irrelevant to the theory being tested; these are 'controls' suggested by competing or complementary theories" (88).

Sartori's comment is just part of a debate urging researchers to be more wary of including any ostensibly relevant variables into multivariate models (Achen, 2002; Ray, 2003). Their argument is additional covariates should be included only if the researcher can explain why the relationship between the primary explanatory variable and the dependent variable might be meaningfully different with the inclusion of a specific covariate; thus as a general rule Achen (2002) actually suggests including no more than three total variables in an empirical model. Sartori (2005) indeed utilizes this strategy in her own work acknowledging: "For these reasons and others, methodologists are beginning to question the use of the regression equation as a dumping ground for

[50] The one small change involves Africa in which the positive and significant relationship between naval arms races and conflict onset weakens slightly to about $p \leq .10$ when the 20% threshold is used.

unwanted variables. Achen (2002) suggests 'A Rule of Three' (ART): no more than three independent variables per equation (in the absence of formal theory that points to more)" (88).

In light of this debate it is important to note scholars cannot definitively conclude the extent to which Achen's (2002) ART claim is meant to be literally applied. At the very least, it is an important cautionary warning against casually dumping every seemingly relevant control variable into empirical models of interstate conflict. In the context of statistical analysis the debate is particularly important because it calls into question the conventional wisdom that argues "additional control variables *cannot* artificially inflate the estimated impact of our variable of interest" (Gelpi and Feaver, 2002: 783). In a recent related discussion of methodological concerns Clarke (2009) discusses specifically the nature of omitted variable bias. He makes no strict claim about the number of control variables researches should incorporate but notes: "Just as we are likely never in the position of working with a correctly specified model, we are likely never in the position of considering a single omitted variable or a single set of omitted variables...By including additional control variables in our specifications, we could very easily be making the bias on the coefficient of interest worse" (63).

Indeed, Clarke (2005; 2009) demonstrates mathematically how the inclusion of ostensibly relevant control variables can either *increase or decrease* the bias on the estimated coefficient of interest. In other words, "Including more variables in a regression, even relevant ones, does not necessarily make the regression results more accurate" (Clarke, 2009: 57). Thus, given the inability for any theory to accurately

specify all relevant variables along with the mathematical potential for control variables to increase the bias upon the variable of interest it becomes far less appealing to utilize a 'garbage can' approach to regression analysis.

As a result, I conduct my empirical analyses in the following three chapters using the strategy employed by Sartori (2005). The primary empirical models I estimate and the results I present in the body of each empirical chapter report the relationship between arms racing and interstate conflict with two control variables I have determined to be most relevant for my particular analyses. I now explain the two main covariates I include in my main empirical models, the justification for including these two, and their measurements.

Power Parity

An important theoretical tradition in the conflict literature has argued states with relatively equal power capabilities are more likely to engage in conflict with one another since neither side is assumed to have a clear advantage. Numerous conflict scholars have argued accordingly that *power parity* is the scenario most likely to facilitate militarized conflict between states (Oneal and Russett, 1997; Sample, 1998a; Reed, 2000; Sample, 2002; and Senese and Vasquez, 2008). Parity increases the likelihood of conflict because under such conditions "...*both* sides see a prospect for victory...With the alternative capability distribution – preponderance – the weaker cannot afford to fight, and the stronger usually does not have to in order to achieve its goals" (Geller, 2000: 263). Still, arms racing is a unique form of interaction between

states that warrants independent theoretical and empirical consideration. The relationship between arms racing and conflict should maintain meaningful explanatory power even when the power parity control variable is present in my empirical specifications.

The inclusion of a measure of power distribution between a dyad is especially important for this study because weapons themselves are measures of state power and capability. One of the strongest counter arguments to the arms race hypothesis is that the power distribution of the dyad is driving the onset of conflict, not their arming behavior. Sample (1998a) includes a power parity control variable in her own arms race research for this exact reason noting that accounting for power parity "...is important because it offers an alternative theoretical explanation for the observed escalation of disputes characterized by mutual military buildups...the arms buildup might be less important intrinsically than the fact that it often represents the countries' move toward parity..." (167).

Thus, I include a control variable that is the natural log of the capability ratio of the strongest state to the weakest state in the dyad. In this sense, the variable is actually a measure of power disparity since it represents how divergent two states' capabilities are from one another. The natural log of a dyad's capability ratio offers a useful representation of both state's relative capabilities reflected in an assertion by Boehmer, Gartzke, and Nordstrom (2004) who note "We take the natural logarithm of the variable [capability ratio] since power arguably has diminishing returns to scale" (21).

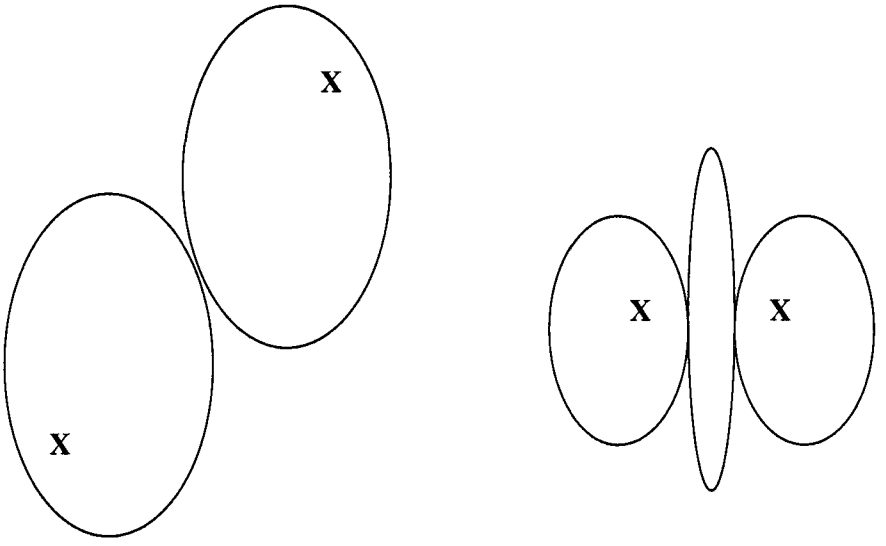
I measure capability using the Composite Index of National Capabilities values from the National Material Capabilities dataset (v3.0) over the period 1816-2001 that I borrow from the study conducted by Oneal and Russett (2005). This dataset provides a measure of annual state power constructed over six primary components: energy consumption, iron and steel production, military expenditure, urban population, and total population. Each component is assigned a specific value based on data collected by the Correlates of War project. For each state each of its six individual indicators are reconfigured as a proportion of the total system's capability (power) for that year. These six separate proportions are then averaged together to produce a single numerical figure that is the overall capability of a state as a proportion of the entire international system.

Contiguity

The relationship between distance, contiguity and international conflict is an important dynamic in international relations research. Empirical studies relating both distance and contiguity to interstate conflict have been consistent in their findings that the closer states are together the more likely there is to be conflict. In comparing the average intercapital distances between fighting states to the entire population of states in the system from 1816-1965 Gleditsch and Singer (1975) reported the overall distance between fighting states to be much lower. Gochman (1990) showed that between 1816-1976 states that shared a common border (contiguous) or were separated by 150 miles or less of water accounted for about two-thirds of the militarized disputes during

that period. These and other studies show interstate conflict is often about the opportunity to wage battle against challenger states; clearly, shorter distances and direct borders increase the opportunity for states to fight one another. Still, which concept – distance or contiguity – should be controlled for in my analyses of arms racing and conflict? Consider the following simple diagram:

Figure 4.2
Thinking About Distance Versus Contiguity



Group A **Group B**

Recall interstate distance is commonly measured by intercapital distances. The states in Group A represent a situation where intercapital distance appears relatively large – that is, the capitals marked by **X** are as far apart as possible – yet both states are still contiguous with one another. The states in Group B show a different situation. Here, the states on the left and right of the middle state have capital cities quite close to

one another but they are not contiguous as evidenced by the tall, narrow state separating them. So while a distance variable would suggest both states are extremely proximate and could ostensibly get to one another easily it would miss the fact that they are not actually contiguous; the lack of a direct border therefore makes it much more difficult to wage conflict directly especially since there is no guarantee the buffer state (the tall narrow state above) would be sympathetic to either state's desire to cross through its borders.

Hence, contiguity has been an important covariate in a variety conflict studies throughout the years and the positive relationship between contiguity and conflict is supported by a number of strong empirical findings (for example: Most and Starr, 1980; Bremer, 1992; Lemke, 1995; Hensel, 2000; see a concise review of contiguity studies in Senese and Vasquez, 2008: 105-108).[51] Controlling for contiguity is important because states might both arms race and fight one another because they are proximate. That is, some could argue contiguity leads states to arm against one another which then may provoke conflict onset between such states. Although I argue throughout this dissertation that states tend to have regional and not simply 'neighborly' concerns the potential for contiguity to influence arming as well as contiguity's demonstrated strong and positive effects on conflict suggests contiguity (as opposed to other potential control variables) is an appropriate covariate for my model.

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[51] It is important to note here again Vasquez (1993; 1995; 2000) has produced compelling empirical support suggesting it is the *territorial claims* of neighboring states that best explains the effects of contiguity upon interstate conflict. In their most recent comprehensive study Senese and Vasquez (2008) conclude "The results produced by our analysis lend strong support to the unified territorial explanation of conflict and war. It was found that pairs of states with an outstanding territorial claim are significantly more likely to engage in militarized disputes than are dyads with no outstanding territorial claims" (100).

Thus, if arms races are driving interstate conflict then they should explain a reasonable amount of variance in the outcome variable even when contiguity is included as a control variable. I use a measure of direct contiguity as developed by the COW project and obtained from the study by Oneal and Russett (2005). It is a dichotomous measure of contiguity where a value of 1 indicates direct contiguity and 0 represents no shared border.

Methodology

In each of the three empirical chapters that follow I utilize logistic regression to evaluate the central hypothesis of this dissertation: the relationship between arms racing and conflict onset. Since the data is binary time series and cross-sectional there is a potential for the temporal independence assumption to be violated. I adopt a strategy as suggested by Carter and Signorino (2007) and generate a set of variables that tracks the number of peace years preceding the onset of a militarized interstate dispute.[52] Specifically, I generate a cubic polynomial that represents the length of non-eventful binary occurrences (the number of peace years). The authors provide empirical examples showing how the cubic polynomial often outperforms the use of time dummies and splines popularized by Beck, Katz, and Tucker (1998). The results are clustered on the dyad due to the possibility of intra-cluster correlation. In addition, the results section in each of the empirical chapters also contains a set of predicted

[52] For a technically detailed account see their unpublished manuscript at http://www.rochester.edu/college/psc/signorino/research/CarterSignorino2007.pdf

probabilities for conflict onset using the statistical package CLARIFY as developed by King, Tomz, and Wittenberg (2000).

Appendix 4A
Coding Manual: The Military Balance

Overview

This is the coding manual for The Military Balance reference series detailing the variables and coding procedures used for recording and organizing the data obtained from The Military Balance. The Military Balance is a reference series published yearly since 1965 which reports detailed figures for the weaponry and weapons systems for states in the global community. The detailed arms data used in this project were obtained solely from The Military Balance reference series over the years 1970-2000.

The Military Balance contains individual yearly entries for states in the global system organized by region (Europe and Africa, for example). This project focuses upon three primary geographic regions: the Middle East, Africa, and Latin America. The Military Balance contained detailed arms data on the number and types of weapons held by the states in each of these three regions.

The primary goal of this portion of the project was to code only the most relevant, offensively geared arms and weapons for each state. This means not every piece of military hardware or weapon listed for each state is actually counted in the final tally. For example, helicopters explicitly listed as combat or attack helicopters were tallied while transport and medical helicopters were not counted and included in the final tally of a state's military. This also means only weapons listed under a state's 'Armed Forces' or 'National Armed Forces' are considered for tally; forces categorized by The Military Balance as part of a state's 'Paramilitary', 'Civilian Force', 'Forces Abroad' or 'Police Force', for example, are not considered for tally in the state's final weapons total.

Weapons for each state's national military force in The Military Balance are primarily organized under several broad headings consisting of 'Army', 'Navy', and 'Air Force' with occasional subheadings of 'Marines' or 'Naval Air Force'. This categorization is consistent with the goal of analyzing three various forms of weaponry and, ultimately, arms racing: land, sea, and aerial based weaponry and racing. Thus, data is recorded as variables which reflect these three broad types of weaponry. The following section describes the variables coded from The Military Balance.

Variables

state – the Correlates of War three letter country abbreviation

ccode – the Correlates of War three number country code

year – the year from which a state's data was collected

ground – the primary land based weapons of a state. This tally includes the following land based weaponry:

> *MBT* – main battle tanks
>
> *AIFV* – armored infantry vehicles
>
> *APC* – armored personnel carriers
>
> *RECCE* – reconnaissance vehicles
>
> *SP* – any guns or mortars explicitly listed as self-propelled

navy – the primary sea based weapons of a state. This tally includes the following sea based weaponry:

> *PSC* – Principal Surface Combatants. This includes major warships such as destroyers, frigates, and corvettes
>
> *FAC* – Fast Action Combatants. The number of smaller combatant vessels of a state that includes missile craft, torpedo craft, and armed patrol craft. Inshore patrol craft, lake/river patrol, mine warfare/countermeasure craft, and support craft are not included in this tally

air – the primary aerial based weapons of a state. This tally includes the following air based weaponry:

> *FGA* – Fighters and Fighter Ground Attack. These are the primary combat aircraft of a state. Reconnaissance, transport, and training aircraft are not included in this tally
>
> *Heli* – the number of combat helicopters of a state. This includes only combat oriented, weapons outfitted helicopters and not transport, support, or medical helicopters

Notes on Coding

Weapons tallied in this data set are organized always by their physical function, not always by their location in The Military Balance. For example, combat helicopters listed under a state's army branch would be tallied in the *air* variable, not the *ground* variable. Combat aircraft listed under a state's naval air force would also be tallied in the *air* variable, and not the *navy* variable.

Any weapons listed as 'in reserve' are included in the final tally for that variable.

Any weapons listed as 'to be delivered in June of 19xx', for example, are not included in the final tally for that variable. Only weapons physically possessed by the state are coded.

Any weapons listed as 'in retrofit' or 'undergoing modernization' are included in the final tally for that variable.

Population figures or defense expenditures from any other year but the current year being coded are recorded as missing data.

In some rare cases, The Military Balance does not/cannot report an actual numerical number for some weapon or weapon system. For example, it will list 'some combat aircraft'. In these cases, the variable is recorded as missing data.

Chapter 5

Arms Racing and Conflict in the Middle East

5.1 Introduction

This chapter contains the empirical results for Hypothesis 1 as evaluated for the minor power states located within the Middle East from 1970 to 2000. As I will do for the African and Latin American regions I begin with an introductory description of the Middle East involving rivalry, number of militarized interstate disputes and wars, and the proportion of global military spending of the region at 1985 (a halfway point of my temporal domain). In so doing my intention is to give the reader a substantive overview of the region in terms and concepts familiar to conflict scholars.

After this general account of the Middle East I move on to some descriptive statistics about the prevalence of arms racing as well as the distribution of arms racing across the three primary categories. The second section presents empirical results regarding the central relationship between dyadic arms racing and the likelihood of interstate conflict. I also report predicted probabilities linking the presence of various forms of arms racing to conflict when the control variables take several different values.

5.2 The Middle East, 1970-2000

My analysis of the Middle East over this time period involves all states located in the Middle East including Iran and Egypt but not including Turkey.[53] The list of countries used can be found at the end of this chapter in Appendix 5A. As I discussed earlier, the rivalry literature has shown minor power states to be involved in rivalries with one another to a fairly high degree over the years. Referenced in chapter four Thompson (2001) provides a list of states involved in a strategic rivalry that covers the period 1816 through the year 1999. An investigation of his list of rivalries reveals there are nineteen strategic rivals present at some point during my period of study 1970-2000. The following table lists the strategic rivals from the Middle East as well as the years active for each rivalry:

[53] There continues to be come controversy over the political and geographic classification of Turkey as a part of the Middle East region. Clearly, its land borders with several Middle Eastern states provides a context for important interactions (such as issues relating to Kurdish independence and migration in Eastern Turkey) with some Middle Eastern states. However, Turkey's secular culture and membership in organizations such as NATO and the Organization for Economic Cooperation and Development (OECD) lead many to classify it as a Westernized, European state (officially, it is part of both Europe and Asia).

Table 5.1
Rivalries of the Middle East, 1970-1999

Rivalry	Years Active
Bahrain – Qatar	1986-
Egypt – Iran	1955-1971
Egypt – Iran	1979-
Egypt – Iraq	1945-
Egypt – Israel	1948-
Egypt – Libya	1973-1992
Egypt – Syria	1961-1990
Iran – Iraq	1958-
Iran – Israel	1979-
Iran – Saudi Arabia	1979-
Iraq – Israel	1948-
Iraq – Kuwait	1961-
Iraq – Saudi Arabia	1968-
Iraq – Syria	1946-
Israel – Jordan	1948-1994
Israel – Syria	1948-
Jordan – Syria	1946-
Oman – Dem. Rep Yemen	1972-1982
Saudi Arabia – Yemen	1990-

This table shows the extent to which states in the Middle East have engaged one another in rivalries over the years. Not surprisingly, almost every state in the Middle East has been involved in a rivalry with a regional partner for at least some period of time since 1970. Some of these rivalries have started and ended in my period of study, such as the Egypt – Libya rivalry that lasted from 1973-1992 or the Oman – Democratic Republic of Yemen rivalry spanning 1972-1982. Most of the rivals listed above, however, are far more longstanding with origins dating back to around the end of World War II. As well, many of these same rivalries are ongoing with no clear end date as of 1999 which is the last year of Thompson's (2001) coding for strategic rivals.

To investigate the presence of militarized disputes I use MID version 3.04 as obtained from Oneal and Russett (2005) and count the total number of MIDs in the Middle East in which there was at least one Middle Eastern state on both sides. Although the newest MID data exists as version 3.10 after consulting this newer version I find no significant differences between both data sets (such as the addition and/or subtraction of MIDs). During the period 1970-2000 there were 105 militarized interstate disputes (MIDs) in the Middle East. Given my temporal domain is thirty years, this equates to exactly 3.5 militarized disputes per year between states in the Middle East.

Of these militarized disputes, the Correlates of War Interstate War Data (v3.0) reports four wars in the Middle East during my period of study: Yom Kippur (1973), Iran – Iraq (1980-1988), Israel – Syria/Lebanon (1982), and the Gulf War (1990-1991). Lastly, I report the Middle East's total military expenditures as a proportion of the total *global* military expenditures for the year 1985 (the halfway point of my temporal domain). In 1985, the Middle East accounted for approximately 8.1% of the total global military expenditures for that year. For comparison, the states comprising the North Atlantic Treaty Organization (NATO) in 1985 accounted for roughly 43% of global military expenditures.[54]

[54] Of this figure, the United States comprises 31% of NATO's 43% share of the total global military expenditure.

5.3 Descriptive Statistics

A survey of the data for my sample of Middle Eastern states over the period 1970-2000 shows that there are 11 ground based arms races, 16 sea based races, and 7 air based races.[55] This distribution should not be entirely surprising considering there are no landlocked states in the Middle East and so these states are maintaining and expanding at least some form of naval forces.[56] The following table shows the correlations for the three primary arms racing variables in the Middle East along with contiguity and capability ratio, the two primary control variables:

Table 5.2
Pearson Correlation Coefficients for Ground, Sea, and Air Arms Racing

Model Variables	Ground	Sea	Air	Contiguity	ln(Capability Ratio)
Ground	1.00	–0.002	0.39	–0.006	–0.02
Sea		1.00	–0.02	0.002	–0.02
Air			1.00	–0.06	0.03
Contiguity				1.00	0.03
ln(Capability Ratio)					1.00

N = 2783

These figures show the correlation between ground races and sea races as well as the correlation between sea racing and air racing to be nearly 0 (both coefficients are only slightly negative). The correlation between ground based arms racing and aerial

[55] Although a possibility there were no cases in which all three forms of arms racing were present simultaneously in the Middle East during this period.

[56] It should be noted here that many of the Middle Eastern navies are equipped for primarily coastal defense and would not be considered sea-faring navies similar to some European countries or the United States navy. For example, most Middle Eastern states employ small fast action combatant vessels such as torpedo or missile boats that stay relatively close to shore and are not intended for major sea faring naval warfare the way major warships such as destroyers or frigates are.

arms racing, however, is positive at 0.39. While this is not a particularly strong correlation it does suggest that at least part of the time states are engaging in both ground and aerial arms races with one another. To a certain extent this makes some sense considering that many militarized operations are ground based but with some form of aerial support. In fact, some might have expected this correlation to be much higher than the figure I report here.

Still, it is important to remember the constraints many small states face; while larger, more powerful states may be able to engage in multiple forms of arms racing simultaneously smaller states have scarce resources making it difficult to expand and compete within multiple types of military weaponry if they are able to expand their militaries at all. In addition, the correlation matrix indicates almost no multicollinearity between any of the arms race variables and the two control variables or between both control variables themselves. Lastly, I present some basic statistics regarding the overall pattern of arming across all three types of weapons in the Middle East from year to year in the following table:

Table 5.3
Likelihood of Increasing Arms in Following Year

Arms Type	Increase in Arms at *t+1*
Ground	62%
Sea	31%
Air	51%

N = 2783

These simple percentages indicate the likelihood that any state in the Middle East over the period 1970-2000 will *increase* its weapons from one year to the next. To calculate these figures I simply divide the number of times states increased their weapons from *t* to *t+1* by the total number of observations where an observation is a state's particular weapons inventory from one year to the next (Iran's naval weapons from 1980 to 1981, for example). The figures indicate that approximately 62% of the time states increased their ground forces from one year to the following year. For sea based forces an increase in weapons from one year to the next occurred 32% of the time and 51% percent of the time for aerial weapons.

5.4 Empirical Results: Hypothesis 1

H1: *The presence of an arms race increases the likelihood of international conflict.*

The following table lists the empirical results for the central research question of this dissertation: the relationship between arms racing and international conflict. What I assume is that contentious issues propel states into dangerous patterns of bilateral arms competitions. An arms race occurs when two states are in contention over some issue/s and proceed to increase their arms at a level that is far higher than the average

arms increases for all states in a particular region, in this case, the Middle East. As a result, the presence of an arms race between two states should increase the likelihood of conflict onset.

Furthermore, I have argued one of the primary contributions of this research is the ability to estimate separate effects of arms racing across three different types of weaponry. To review, the data are analyzed by observing whether instances of arms races between states are followed by a militarized interstate dispute at *t+1*. As such the table below reports the individual estimated impacts of ground, naval, and aerial arms racing on the likelihood of conflict. Each model includes a measure of direct contiguity and power capability ratio as I have argued these covariates represent two of the most theoretically salient robustness checks on my primary independent variables.

I also note the empirical results below are not obtained just from all cases in which contentious issues were present; rather, the models are estimated over the entire number of potential observations including cases in which tension was *not* present and extraordinary arming and conflict occurred anyway, for example. In other words, I analyze all dyad years but code a 0 for the arms race variable if there were no contentious issues present between two states (even if they indeed had extraordinary bilateral arming). All models are evaluated using logistic analysis and although not shown in the table all model coefficients are estimated with the cubic polynomial term that is the number of peace years in between conflict. This is included in order to counteract potential temporal dependence in my binary time series cross-sectional data. The statistical results are as follows:

Table 5.4
Multivariate Models for Conflict Onset
Three Types of Arms Racing, 1970-2000

Variable	Model 1 Ground Races	Model 2 Sea Races	Model 3 Air Races
Arms Race Type	1.253 (0.397)***	0.782 (0.442)*	0.159 (0.951)
Contiguity	1.443 (0.311)***	1.392 (0.300)***	1.427 (0.316)***
ln(Capability Ratio)	−0.086 (0.153)	−0.084(0.152)	−0.108 (0.160)
Constant	−2.158 (0.355)	−2.105(0.353)	−2.030 (0.364)
N	2783	2783	2783
Log-likelihood	−351.84	−354.02	−355.61
Pseudo-R^2	0.213	0.208	0.205

*p ≤ .10, ***p ≤ .01, robust standard errors in parentheses

As the previous literature has shown, contiguity exhibits the highest level of statistical significance in each of the three models above. The variable itself is measured as a dichotomous value that takes the value of 1 for direct contiguity and 0 otherwise. The results above therefore suggest that in all three models the presence of direct contiguity is positively associated with the onset of interstate conflict. Even in spite of the strong effects of contiguity, two of the three individual arms race variables exhibit statistical significance and in the expected direction. Ground based arms races are associated with conflict onset at the p ≤ .01 level of significance while naval arms racing is significant at the p ≤ .10 level of statistical significance. Although the coefficient for aerial arms racing is positive and in the expected direction the impact of this variable is not significant making it impossible to reject the null hypothesis for aerial arms racing and conflict onset in the Middle East. It is possible the air arms race variable is not significant due to the moderate correlation (0.39) between the ground and aerial arms

race variables reported earlier; since ground and aerial racing occur together with some frequency any independent effects of aerial arms racing upon conflict likely wash out.

Additionally, both ground and naval arms racing exhibit statistical significance with conflict onset even in the context of the power parity control variable which itself is not significant with conflict onset in any of the three models estimated. This is encouraging given the argument that arms and weapons may simply be a function of overall state power and capability (the endogeneity critique). My results above, however, suggest two of the three independent arms race variables – ground and sea – are predicting variance in the dependent variable of interstate conflict. I believe these are relatively robust findings considering the correlation coefficients reported earlier show almost no multicollinearity at all between the power parity control variable and any of the independent arms race variables.

Most importantly, these coefficients indicate the importance of studying and evaluating the effects of *specific* types of arms races. A fundamental argument I have advanced throughout this dissertation is the importance of categorizing arms races broadly by ground, sea, and aerial based weaponry in order to observe their potential for independent effects on militarized conflict. My empirical results for the Middle East clearly reveal variation in each of the three types of arms races that would be otherwise indiscernible using a generic conception of arms racing where all weapons systems are collapsed into one single category. Such variation will be an important result to observe and interpret in the next two chapters when I evaluate arms racing and conflict in Africa and Latin America.

Moving along it is important to ask whether these empirical results have face validity. A quick survey of the actual data suggests the model of arms racing employed here indeed captures many instances where arms racing would be expected and where conflict later occurred. Israel, not surprisingly, engages in ground, air, and sea based arms racing with a majority of the Middle Eastern states from 1970-2000. Specifically, Israel is involved in some form of arms racing with Saudi Arabia, Syria, and Iraq – three of the five participant states – prior to the 1973 Yom Kippur War.[57] Israel and Syria engage in ground and sea arms racing in the 1970's and early 1980's in the lead up to their war in 1982.

Alternatively, there are no arms races between Iraq and Kuwait or any of the Middle Eastern coalition forces in the lead up to the Gulf War that began in 1990. Given the massive amount of economic and military losses suffered by Iraq during the Iran – Iraq war throughout the 1980's it makes sense Iraq would have little ability to expand its military forces quickly against any enemy in the Middle East (such as Kuwait or other coalition states) after such a crushing stalemate with Iran. Indeed, a quick investigation of the weapons data for Iraq shows that Iraqi forces across all three weapons categories (ground, sea, and air) either stagnated or decreased in the several years leading up to the outbreak of the Gulf War. For example, from 1984 to 1988 Iraq's total air force (combat fighters and helicopters) decreased from 580 to 500 and only slightly increased to 513 in 1989 on the eve of the war. This suggests Iraq was incapable of engaging in

[57] Egypt and Lebanon, the remaining two states involved in the Yom Kippur War, are not involved in arms racing with Israel.

any form of arms racing, regardless of any contentious issues that were present, and so no arms races are identified previous to the Gulf War.

Hence, in this case, the model does not predict the onset of the Gulf War (the initial conflict between Iraq and Kuwait) since there were no rapid bilateral arms buildups; beyond the lack of bilateral arming, an examination of the United Nations voting data shows that in both 1989 and 1990 the distance in ideal points between Iraq and any of the Middle Eastern coalition states, which includes Kuwait, never reached a high enough threshold to be considered seriously contentious as I have defined for this dissertation. The absence of severe tension as reflected by United Nations voting may very well be related to the fact the invasion itself caught much of the world by surprise. A BBC News (2000) review of the Gulf War notes "The suddenness of the strike took the world by surprise"; in a more detailed account Crystal (1995) explains in a book length account how "The Iraqi invasion caught Kuwait by surprise...relations appeared to have been improving in recent years. Throughout the Iran-Iraq War of the 1980's, a *de facto* alliance had been forged between the two states, with Kuwait supplying Iraq with $13 billion in direct support..." (171). Given these reactions to the outbreak of the Gulf War, then, it becomes easier to understand why the model would *not* predict the particular conflict between Iraq and Kuwait.

Interestingly enough, with respect to the Iran – Iraq War fought from 1980-1988 there appears to be little arms racing prior to the outbreak of violence as well. Both states engage in a naval arms race from 1970-1975 but there are no other instances in the years leading up to the start of the war in 1980. An investigation of the data reveals

an unexpected finding: the level of policy divergence between Iraq and Iran during several years preceding 1980 never reaches a critical level. Recall that the average distance in ideal points for any two states in the Middle East during my period of study is approximately 0.32. The average difference in United Nations ideal point estimates for Iran and Iraq during this period and throughout their eight year war never gets much larger than approximately 0.40, nowhere near the critical level needed that would indicate serious tension.

There may be an explanation for this interesting finding, as well. The pro-Western monarchy of the Shah of Iran begins to dissolve in December 1978 and by January of 1979 the Ayatollah's Islamic fundamentalist regime assumes leadership of Iran. Clearly, at some point there should be a noticeable divergence in the preferences exhibited by Iran and Iraq in the United Nations General Assembly voting. It is the timing of the Iranian revolution, however, that has implications for Iran's behavior in the UNGA. This is because the Shah's ambassador to the United Nations Feyerdun Hoveyda (as well as other key diplomats) is officially dismissed from service on January 17, 1979 (BBC, 1979). Nonetheless, it is unclear at what point the new Islamist Iranian government sends diplomats to the UN to cast votes on its behalf (votes that would ostensibly be more contradictory to Iraqi votes); for example, I might expect to see Iran's new policy preferences to be reflected in their UN votes at least by 1980.

Digging deeper into Iran and Iraq's United Nations roll call data indeed provides some support for my expectation that Iran's new policy preferences may not have been reflected until 1980. Using roll call votes obtained from Voeten and Merdzanovic (2009)

I conduct simple correlations between the voting records of Iran and Iraq for the years 1979 and 1980. Their data set contains individual voting records organized by year and United Nations resolution number. Thus, I merge the votes of both Iran and Iraq by resolution number and year in order to ensure the correlations reflect the votes cast by both nations for the proper resolutions. In so doing, I find Iran and Iraq's voting records for 1979 to be positively correlated at approximately 0.47 meaning nearly half of the time they voted the same in the General Assembly. Running the same correlation for all votes cast in 1980 shows both nations votes to be correlated at only 0.30.

Analyzing the actual roll call votes of both Iran and Iraq therefore shows that even in 1979 Iran and Iraq are still voting similarly about half of the time. It is not until the beginning of their war in 1980 – fully one year after the Ayatollah assumes power in Iran – that the similarity between Iranian and Iraqi voting in the United Nations drops significantly to about 0.30 suggesting that less than one-third of the time are both states voting the same. There is little doubt serious and long standing issues precipitated their war including issues such as territorial claims, Arab and Persian ethnic tensions, and the religious ideological competition between newly Islamist Iran and Saddam's primarily secularized Iraq. Yet, even though contention over highly salient issues was clearly present this tension does not appear to translate into any meaningful divergence in both states' United Nations roll call voting until 1980 and even then the overall tension is still less than my adopted threshold.[58]

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[58] In 1980, the start of the war, the Euclidean distance between Iraqi and Iranian UN ideal points approaches 0.60 which indicates a fairly high level of tension but still lower than one standard deviation from the mean, my coding threshold for tension as discussed in chapter four.

The result, therefore, is my model does not predict the beginning of the Iran-Iraq war but, again, for good reason: the policy divergence that would be expected between Iraq and the new Iranian regime does not actually occur until 1980, one year after the revolution, and even then does not reach the level as to be captured by my model's critical threshold for tension. Having discussed in detail the two specific cases of the Gulf War and the Iran-Iraq war it is important to recognize the overall fit of my model for the Middle East region is reasonably good as indicated by the empirical results reported at the outset.

Before continuing along, some readers may notice Appendix 5B indicates many of the arms races – 21 of 34 – occurring in the Middle East from 1970-2000 involve Israel. For transparency, it is indeed important to understand what effect Israeli cases of arms racing have on the broader empirical results. For example, a quick analysis of all dyads in contention with one another shows approximately 95% of those cases in which tension over issues is present involve Israel and some other Middle Eastern state. Taking this a step further, it is possible to reevaluate the relationship between arms racing and interstate conflict when all cases involving Israel are dropped from the sample and the empirical models reestimated.

Doing so indeed produces some variation from the original model estimates listed in Table 5.4. The most dramatic change occurs between ground based arms racing and conflict; the original coefficient obtained over the entire sample of states was strongly positive and significant. When all cases involving Israel are dropped from the analysis, however, the ground race variable is dropped from the estimation and the

relationship goes away entirely. This means that when Israeli dyads are dropped from the analysis there are no ground based arms races that lead to conflict. Or, alternatively, all ground races that ended in conflict in my sample from 1970-2000 involved Israel.

Contradictory to the effect on ground based arms racing, eliminating Israeli dyads actually improves the estimated coefficient for sea based arms racing and its impact on militarized conflict. Essentially, the association strengthens from an original statistical significance of $p \leq .10$ to an improved level of significance of $p \leq .01$. An examination of the list of naval arms races shows almost all of the naval arms race dyads involve Israel. Thus, it is likely many of the naval arms races involving Israel do not eventually lead to militarized conflict and as a result the statistical association between naval arms racing and militarized conflict becomes stronger when Israeli cases are dropped from the analysis. Lastly, there is no relevant impact on the aerial arms race variable; similar to the original analysis, the coefficient remains positive but does not approach any meaningful level of statistical significance when Israeli dyads are dropped from the estimation.

I present these specific results as an opportunity for readers to understand as much as possible the dynamics at work in the Middle East. That Israel plays such an important role in the arming and conflict behavior of the Middle East, however, should not be taken as evidence against the general theory of arms racing and militarized conflict advanced in this dissertation. Almost any political research involving the Middle East, for example, will be strongly affected by the presence and actions of Israel (in fact,

perhaps no other region in the world is as consistently affected by the actions of one state as in the Middle East). Yet, theories of political phenomenon must be general (as is my theory of arms racing and conflict) in order to provide the most leverage over relationships between important concepts. Although it so happens a majority of arms races do involve at least one specific state (Israel) it should also be noted that – for the most part – Israel and its competitors behave as the theory expects.

Moving along, the question of substantive impact on conflict onset arises. The relationship between explanatory variables and a binary outcome variable is not linear meaning that logistic coefficients and their effects upon the dependent variable cannot be easily assessed using their values alone. Predicted probability calculations are needed in order to understand how changes in the independent variables affect the likelihood of observing the presence of the dependent variable. The final table shows the predicted probabilities for observing conflict onset (a MID) when various types of arms racing are present and with different values for the control variables contiguity and capability ratio:

Table 5.5
Probability of Conflict Onset, 1970-2000
Estimates Obtained from Table 5.4

Variable	Treatment	Pr(Conflict Onset)	% Increase
Baseline:			
Arms Race	0		
Contiguity	0	1.2% (0.004)	-
ln(Capability Ratio)	$\bar{x}$		
Ground Race	1	4.2% (0.017)	250%
Sea Race	1	2.9% (0.015)	142%
Air Race*	1	2.0% (0.019)	67%

Variable	Treatment	Pr(Conflict Onset)	% Increase
Baseline:			
Arms Race	0		
Contiguity	1	4.9% (0.013)	-
ln(Capability Ratio)	$\bar{x}$		
Ground Race	1	16.1% (0.072)	229%
Sea Race	1	10.9% (0.050)	122%
Air Race*	1	8.2% (0.083)	67%

*estimated coefficients not significant

In the first portion of the table the baseline probability of a militarized interstate dispute in the Middle East from 1970-2000 with the natural log of the capability ratio set to its mean and with no direct contiguity and no arms racing of any kind is 1.2%. This is consistent with scholars' understanding that interstate conflicts (and especially wars) are relatively epiphenomenal events. Nonetheless, the presence of a ground race increases the likelihood of conflict onset to 4.2%. This figure may suggest the overall likelihood remains relatively low, but the presence of a ground arms race produces a 250% increase in the chance for conflict – more than triple – from the baseline figure. The next most conflict prone form of arms racing involves naval arms competitions.

States engaging in naval arms racing have a 2.9% overall likelihood of militarized conflict. This translates into a 142% increase over the baseline probability for interstate conflict when a naval arms race is present. Aerial arms racing exhibits the weakest impact, likely for reasons discussed earlier, and the substantive impact of aerial arms racing should not be taken with much confidence given its estimated coefficient does not approach any level of statistical significance.

The second portion of this table investigates the chances for conflict onset when there is direct contiguity between pairs of states. Ground based racing is again highly influential and this time the impact is only slightly less at 229% which is still more than triple the likelihood of conflict in the absence of a ground arms race. Similar to the substantive effects in the first portion of this table naval arms racing is again the second most conflict prone form of arms racing. Among contiguous states, the presence of a naval arms race still increases probability of conflict to roughly 11% for an overall impact that is about 120% greater than otherwise would be. Thus, the substantive impact of ground and sea based arms racing on militarized conflict is positive and significant and the effects do not diminish drastically when controlling for the effect of contiguity. At the very least, arms racing doubles – and in some cases more than triples – the chances that states will end up in militarized conflict with one another.

5.5 Summary and Conclusions

This chapter represents the first empirical test of the relationship between the central theoretical claim that suggests arms racing increases the probability for conflict between states. In this the first empirical chapter I believe the statistical results gleaned from the Middle East region support the theoretical proposition that arms racing leads states into conflict with one another. In the Middle East it appears that ground based and naval arms racing are the strongest predictors of conflict onset. Both of these arms race variables are statistically significant even when controlling for contiguity and power parity. Although the impact of aerial arms racing is in the expected direction I cannot reject the null hypothesis for this type of arms racing. As discussed, the inability for aerial arms racing to exert a strong impact upon conflict onset may be due to some multicollinearity with the ground based arms race variable: since both ground and air arms races occur together with some frequency it appears there is little independent impact by aerial based arms races upon interstate conflict.

Substantively, *ground based arms racing* was most likely to significantly increase the probability of interstate conflict for minor power states in the Middle East. Naval arms racing was the second most important predictor of conflict onset while aerial arms races – although positively associated with an increased likelihood for conflict – did not achieve any level of statistical significance. In general, the entirety of the empirical results for the Middle East are consistent with what might be intuitively expected: ground based forces are the foundation for most militaries and so it is not surprising ground based arms racing exhibits strong effects and is most likely to provoke

militarized conflict. Related to this, a significant amount of ground based military offensives are conducted simultaneously with air support which may partially explain the lack of a strong and independent effect for the aerial arms race variable in my empirical analyses for the Middle East.

Lastly, there are no landlocked states in the Middle East and so it is reasonable to expect these states to expand and compete militarily through the use of naval weaponry. The empirical results indicate states in the Middle East indeed do so and that the presence of naval arms races is positively related to conflict onset and at a statistically significant level. Above all, however, it is important to reemphasize how the statistical results vary across the three types of arms racing analyzed in this chapter. That ground, naval, and aerial arms racing each exhibit varying degrees of impact upon militarized conflict provides early justification for studying different types of military weapons independently.

This dissertation is about studying the relationship between arms racing and conflict amongst minor power states of which the Middle East is just one arena. Chapter six and chapter seven apply the model of arms racing used here to the regions of Africa and Latin America over the same period of 1970-2000, respectively. As explained in earlier chapters the findings obtained from the Middle East region of states should be generalizable to both Latin America and Africa. That is, the theoretical expectation about the relationship between dyadic arms racing and conflict amongst minor powers does not vary by region. Thus, while I expect all three forms of arms racing will be positively associated with conflict onset in all regions I fully anticipate

observing interesting variations in the likelihood of interstate conflict over the individual forms of arms racing (ground, sea, and air) analyzed in this research.

Appendix 5A
Countries of the Middle East

The Middle East, 1970-2000
Bahrain
Egypt
Iran
Iraq
Israel
Jordan
Kuwait
Lebanon
Qatar
Saudi Arabia
Syria
United Arab Emirates
Yemeni Arab Republic
Yemeni People's Republic

Appendix 5B
List of Arms Races, 1970-2000

Dyad	Ground	Sea	Air
Iran – Syria	1973-1977		1972-1977
Iran – Israel	1973-1977	1977-1982 1992-1997	1972-1976
Iran – Kuwait	1973-1977		1973-1978
Iran – U.A.E.	1973-1977		1973-1978
Iran – Iraq		1970-1975	
Iran – Dem. Rep. Yemen			1974-1978
Iraq – Lebanon	1980-1984		
Iraq – Israel	1971-1977		
Syria – Israel	1970-1977	1977-1986	
Lebanon – Israel	1970-1976		
Israel – Saudi Arabia	1972-1977	1978-1986	
Israel – Kuwait	1973-1977		
Israel – U.A.E.	1973-1977	1982-1986 1992-1996	
Israel – Yemen Arab Rep.		1979-1985	
Israel – Dem. Rep. Yemen		1977-1985	
Israel – Bahrain		1982-1986	
Israel – Oman		1979-1985 1992-1997	
Egypt – Syria		1979-1987	
Egypt – Israel		1979-1986 1993-1997	
Egypt – Dem. Rep. Yemen		1979-1985	
Jordan – Kuwait			1973-1977
Jordan – U.A.E.			1973-1977

Chapter 6

Arms Racing and Conflict in Africa

6.1 Introduction

In this chapter I continue my empirical evaluation of Hypothesis 1 in Africa from the period 1970-2000. The first portion of this chapter again presents an overview of the African region in terms of rivalries and militarized conflict. I then move on to the descriptive statistics section in which I provide information regarding the numbers and distribution of ground, sea, and aerial based arms races in Africa. In the final portion of this chapter I present the statistical results concerning the relationship between arms racing and conflict onset. To conclude my investigation of the African region of minor states I discuss the substantive effects of the three different forms of arms racing on the likelihood of militarized conflict as done previously for the Middle East.

6.2 Africa, 1970-2000

For my analysis of Africa I include all states located on the continent as well as several nearby island nations such as Madagascar, Cape Verde, and Seychelles. The full list of states used for my analysis of Africa is available in Appendix 6A at the end of this

chapter. Furthermore, I include Egypt in my analysis of Africa here just as it was for the analysis of the Middle East in chapter five. Most would agree Egypt plays an important political role in both the Middle East and Africa as it does share land borders with nations from both regions (Libya and Sudan in Africa, Israel in the Middle East). It is the only country included in multiple regions in my entire study.

Using the list of strategic rivals from Thompson (2001) again reveals there are twenty nine rivalries in Africa that were present for some portion of the period 1970-1999. I list these rivalries and their dates in the following table:

Table 6.1
Rivalries of Africa, 1970-1999

Rivalry	Years Active
Angola – South Africa	1975-1988
Angola – Zaire	1975-1997
Burkina Faso – Mali	1960-1986
Cameroon – Nigeria	1975-
Chad – Libya	1966-1994
Egypt – Libya	1973-1992
Egypt – Sudan	1991-
Eq. Guinea – Gabon	1972-1979
Eritrea – Ethiopia	1998-
Eritrea – Sudan	1993-
Ethiopia – Somalia	1960-1988
Ethiopia – Sudan	1965-
Ghana – Ivory Coast	1960-1970
Ghana – Togo	1960-1995
Guinea-Bissau – Senegal	1989-1993
Kenya – Somalia	1963-1981
Kenya – Uganda	1986-1995
Libya – Sudan	1974-1985
Malawi – Tanzania	1964-1994
Malawi – Zambia	1964-1986
Mauritania – Senegal	1989-1995
Mozambique – Rhodesia	1975-1979
Mozambique – South Africa	1976-1991
Rhodesia – Zambia	1965-1979
Sudan – Uganda	1963-1972
Sudan – Uganda	1994-
Tanzania – Uganda	1971-1979
South Africa – Zambia	1965-1991
South Africa – Zimbabwe	1980-1992

This list shows Africa has experienced a significant amount of rivalry in the post World War II era and that minor states in Africa, much like the Middle East, are engaging each other in rivalries fairly frequently. Many of these rivalries are consistent with African states known to have poor relations with each other such as Angola's rivalries

with South Africa (1975-1988) and Zaire (1975-1997), Rhodesia (Zimbabwe) and Zambia (1965-1979), and Ethiopia's extensive rivalry with Somalia (1960-1988) to name only a few.

To what degree has militarized conflict plagued the African region from 1970-2000? Here again I use MID version 3.04 from Oneal and Russett (2005) and count the total number of MIDs in Africa in which there was at least one African state on both sides of the conflict; I also note again no significant differences between MID version 3.04 and version 3.10 data sets. During this period of time there were 183 militarized interstate disputes between African states or about 6 MIDs per year. Although this figure is higher than the 3.5 MIDs per year for the Middle East (105 total MIDs) during this same period it is not as high as might be expected considering there are approximately three times more independent states in Africa than the Middle East. Theoretically, the larger amount of independent states in Africa provides many more opportunities for interstate conflict especially when considering the increased number of dyadic relationships present.

However, the 183 militarized conflicts in Africa is not even double the number of conflicts experienced by the much smaller Middle East region suggesting the African region, in general terms, may indeed be less conflict prone over the period 1970-2000. Furthermore, there were two interstate wars fought during this period according to COW data: the Ethiopian – Somalian War from 1977-1978 and the Ugandan – Tanzanian War from 1978-1979. With respect to overall military expenditures, states composing the African region accounted for roughly 1.7% of the world's total military expenditures

in the year 1985. Again, considering the overall size of the African region, this figure is much smaller than the 8% total military expenditure figure reported for the Middle East in chapter five and is also much lower than NATO's 43% proportion of total military expenditures for the year 1985. Thus, it is clear Africa experiences far less external conflict (interstate conflict) than does the Middle East and this overall level of conflict would be even lower were Egypt to be counted as a member of only the Middle East.

6.3 Descriptive Statistics

An analysis of some descriptive statistics for the African region over the period 1970-2000 shows there are 135 ground based arms races, 52 naval arms races, and 204 air based arms races. In Africa it appears air based weapons competitions are the most prevalent form of arms races during the period of study. Ground based arms races are the second most common form of arms racing in Africa which is still somewhat consistent with the notion that land based weapons are foundational to most militaries. Lastly, almost one-third (14 states) of African nations are landlocked states which may contribute partially to the relatively small number of naval arms races occurring in the region from 1970-2000. Where appropriate these landlocked states are excluded in some of the statistical analyses that follow. The fourteen landlocked states are: Botswana, Burkina Faso, Burundi, Central African Republic, Chad, Ethiopia, Lesotho, Malawi, Mali, Niger, Rwanda, Uganda, Zambia, and Zimbabwe.

The ostensibly high number of aerial arms races in Africa is interesting; first, it is important to recognize the actual size of many of the air inventories of African states is

quite small. Some larger states (located mostly in Northern Africa) indeed have moderately sized air forces: in 1985, for example, Nigeria's total air force numbers 49 with Angola having an even larger air force of 141. Yet, a majority of African states maintain only small numbers of aerial combat weaponry. For the same year of 1985 the air force of Gabon is only 11 combat planes strong; Ghana 10, Mali 5, and Rwanda just 4.

The implication, therefore, is that a gain of just 2 or 3 aerial combat vehicles over the span of a few years represents a significant increase in the air forces of many African states and when such increases happen bilaterally and simultaneously then an aerial arms race is coded. Since I do not institute a minimum size threshold for states' air forces, for example, my measure of arms racing may be less suited for some of the very small air forces of African states resulting in arms races that involve increases of just a few weapons over a period of time. As a result, at least some of the aerial arms races identified in Africa may be more a consequence of my particular coding decisions than a reflection of true aerial competitions between some states. Nonetheless, the approximately 200 aerial arms races in Africa comes into focus a bit more when considering that for the thirty year period 1970-2000 this equates to roughly 7 aerial arms races per year. Given there are nearly fifty independent states on the African continent, the overall number of aerial arms races I report appears to be within reason.

The following table shows the correlation coefficients for each of the arms race variables as well as the contiguity and capability ratio control variables included in my model of interstate conflict for Africa. Since there is a group of landlocked states in Africa performing the correlations without excluding such landlocked states (that have

no navies) might bias the coefficients. As a result, the following table is actually a combination of two separate correlations; any correlation cell below involving the 'Sea' variable has been calculated by excluding all landlocked states while all other cells are calculated using the full number of observations. For example, the correlation between ground and aerial racing is calculated over the entire N of 30766 while the correlation between sea racing and ground racing or sea racing and contiguity is calculated over the reduced N of 15168 since all landlocked states are removed from the analysis:

Table 6.2
Pearson Correlation Coefficients for Ground, Sea, and Air Arms Racing

Model Variables	Ground	Sea	Air	Contiguity	ln(Capability Ratio)
Ground	1.00	0.13	0.24	0.03	–0.07
Sea		1.00	0.31	0.06	–0.06
Air			1.00	–0.07	–0.11
Contiguity				1.00	–0.11
ln(Capability Ratio)					1.00

N = 30766, 15168

In general the coefficients above suggest virtually no correlation between any of the three arms race variables with either of the two control variables, contiguity and power capability ratio (with both control variables exhibiting little correlation with one another, as well). Similar to the correlation figures for the Middle East there appears to be some moderately positive correlation between ground based and aerial based arms racing at 0.24 though less than the 0.39 figure reported for the Middle East during the

same time period. Air arms racing is also correlated with naval arms races and at a slightly higher figure of 0.31.

Overall, aerial arms racing is moderately correlated with both naval and ground based arms racing while there is little correlation between naval and ground arms racing. Again, the correlation between aerial arms racing and both other forms of arms racing (although not extremely high) is somewhat suggestive. This is because the resource constraints of minor powers states – especially in Africa – are high enough such that minor power states are unlikely to pursue multiple forms of arms competitions at any given time. As a result, even the moderate correlation between air arms racing and both ground and naval racing amongst African states hints at the importance states may place on aerial support when engaging in either ground or naval arms races. To conclude this section I provide a basic overview of the arming patterns of African states from 1970-2000 using the general percentages in the table below that indicate the likelihood any given state increased a particular form of weaponry from one year to the next:

Table 6.3
Likelihood of Increasing Arms in Following Year

Arms Type	Increase in Arms at *t+1*
Ground	45%
Sea	24%
Air	35%

N = 30766, 21199

These percentages again show the variation in the likelihood of a state in Africa increasing its weapons from one year to the next. I again calculate these figures by dividing the number of times states increased their weapons from *t* to *t+1* by the total number of observations. The figure for naval weaponry is obtained over a smaller set of observations (21199) since landlocked states are removed from the analysis. The above table indicates that approximately 45% of the time a state in Africa increased its ground based weapons during the following year. Additionally, states increased their aerial weapons from one year to the next 35% of the time while naval based weapons were increased from year to year 24% of the time.

6.4 Empirical Results: Hypothesis 1

H1: *The presence of an arms race increases the likelihood of international conflict.*

This section reports the results for the relationship between arms races and international conflict. Once again, the theoretical assumption is that contentious issues provoke large increases in bilateral arming between states. This produces dangerous bilateral arms competitions – arms races – between such states and this increases the likelihood of two states becoming involved in militarized conflict with one another. The

following table represents the impact of arms races upon militarized conflict in the region of Africa over the period 1970-2000. Similar to the results from chapter five, I report separate effects for ground, naval, and aerial forms of arms racing and their impact on militarized conflict. Although not shown in the table all model coefficients are estimated with the cubic polynomial term that is the number of peace years in between conflict. Lastly, all estimates are obtained over the entire set of potential observations and not just cases in which contentious issues and extraordinary bilateral arming were present:

Table 6.4
Multivariate Models for Conflict Onset
Three Types of Arms Racing, 1970-2000

Variable	Model 1 Ground Races	Model 2 Sea Races	Model 3 Air Races
Arms Race Type	0.384 (0.323)	0.960 (0.479)**	0.851 (0.262)***
Contiguity	3.553 (0.234)***	3.848 (0.347)***	3.496 (0.233)***
ln(Capability Ratio)	−0.059 (0.084)	0.107 (0.110)	−0.024 (0.083)
Constant	−5.022 (0.293)	−5.724 (0.492)	−5.157 (0.295)
N	30766	15168	30766
Log-likelihood	−774.60	−360.16	−767.69
Pseudo-R^2	0.309	0.321	0.315

**p ≤ .05, ***p ≤ .01, robust standard errors in parentheses

Consistent with the results reported earlier for the Middle East the above table shows that direct contiguity is again positively associated with conflict onset at the highest level of statistical significant (p ≤ .01) in all three empirical models. Of the three primary arms race variables, naval and aerial based arms racing are positively associated

with militarized conflict in Africa. Both relationships are relatively strong with naval based arms racing increasing the likelihood of militarized conflict at the $p \leq .05$ level of statistical significance and air based arms racing being associated with interstate conflict in Africa at the $p \leq .01$ level. Although in the expected direction ground based arms races, however, do not appear to have any meaningful impact on the likelihood of states becoming involved in militarized conflict with one another (with the standard error almost as large as the coefficient estimate).

In the interest of full transparency it is important to note here the actual average change in bilateral air weaponry over any five year period in Africa 1970-2000 turns out to be -1%, or basically no change. If this figure were to be used then any positive increase in bilateral arming would constitute an extraordinary arms increase. In order to provide a stricter test of the theoretical relationship I instead used 10% as the average bilateral increase in aerial weapons over any five year period and coded any dyad with a five year increase at least 25% higher than this figure (or, about 13%) as involved in extraordinary arming. Although the 10% threshold is an artificial substitute it helps eliminate the possibility of any positive bilateral increases being coded as arms races. In this regard, the threshold helps produce a more robust test of the relationship between aerial arms races and the onset of militarized conflict.

Nonetheless, the individual coefficient estimates for each of the three arms race variables (ground, sea, and air) are noteworthy. Recall that in the Middle East over the same time period it was naval and ground based arms racing that increased the likelihood of interstate conflict while aerial based races had no significant impact. Here

in Africa, ground based arms races do not affect the likelihood of militarized conflict but naval and aerial races do. The inability to reject the null hypothesis for ground races is not due to the lack of ground based arms races occurring in Africa; as discussed earlier in this chapter ground arms races are indeed the second most common form of arms races in Africa from 1970-2000 behind aerial arms races. Hence, African states are engaging in ground based arms races but these particular forms of arms races do no appear to be ending in militarized conflict as the general theoretical account suggests.

There is at least one intuitive explanation for this outcome. The large size of the African region itself means that states in contention with one another are likely to have much greater distances to travel than states located within the Middle East, for example. Even many of the states themselves are large enough such that the militaries of contiguous states may still need to travel long distances in order to strike at capital cities or important military and production facilities. As noted earlier, it is certainly the case my specific measure of arms racing identifies at least some aerial competitions in Africa that are simply much too small to be taken seriously but that are included in the overall tally of aerial arms races, nonetheless. Even with this in mind, however, the formidable expanse of the African continent is an alternative possible explanation for why aerial arms races outnumber ground and naval races in Africa. Some important examples indeed reflect the significance that aerial weaponry has had in militarized conflict in Africa.

During the Angolan civil war of the 1970's and 1980's the FAPLA (Popular Armed Forces for the Liberation of Angola) had to fight off not just the UNITA (National

Movement for the Total Liberation of Angola) but also interventions by South Africa's formidable air force which was carrying out attacks in support of the UNITA insurgency: in 1984, for example, "The Angolan Government said that since the invasion [by South Africa] began, dozens of civilians had been killed in bombing raids on the towns of Cuvelai, Cahama and Caiundo, which are all about 100 miles north of Angola's border with South African-controlled Namibia" (Giniger, Freudenheim, and Douglas, 1984).

In an attempt to repel such attacks, the FAPLA along with Soviet and Cuban assistance pursued a strategy of air superiority allowing them to execute strikes closer towards South Africa's border. In a detailed account, Turner (1998) explains:

> "The FAPLA air threat to UNITA lay with more and better fixed-wing aircraft and combat helicopters to support ground operations. Increased use of helicopter resupply and reinforcement to isolated garrisons and forward units diminished UNITA's effectiveness in interdicting overland routes. By the early 1980's FAPLA was commonly using the MiG-21 MF multi-role fighter, especially in the fighter-bomber role, and was phasing out the older MiG-17. The older Mi-8/17 transport and assault helicopters were augmented by the newer Mi-24/25/35...FAPLA's combat helicopters provided fire support to ground operations as well as playing a major logistical role. They were also used to insert special forces and teams for deep reconnaissance behind UNITA lines" (116).

The importance of aerial weaponry for many African states is seen in more recent examples, as well. Beginning in 1998 and escalating seriously in the year 2000, Eritrea and Ethiopia again found themselves involved in serious militarized conflict regarding a small area of disputed territory along their border. A significant amount of the militarized violence that occurred between both states involved strategic air strikes against targets. Jane's Information Group (2009) reports both Eritrea and Ethiopia were actively engaged in a competition for aerial superiority in the lead up to their conflict

with the Eritrean air force purchasing a group of MiG-29 Fulcrum combat aircraft only to be countered by an acquisition of Su-27 Fulcrum long range fighters by the Ethiopian military. With over 500 miles between some of the major air bases in Ethiopia (Addis Ababa and Gondar) and Eritrea (Asmara) both states used extensive aerial combat to inflict damage during their territorial dispute.

In 2004, one of South Africa's largest news outlets reported on the danger of an aerial arms race between some south African states, including South Africa, and Zimbabwe. The South African news service – News 24 – noted "Reports suggesting southern Africa faced a potential arms race because of Zimbabwe's purchase of $240m worth of Chinese fighter jets were alarming..." (2004). The most recent example of the importance of aerial weaponry and air superiority in Africa involves Algeria and Morocco, two North African states with long standing issues including border disputes. In 2008, Al Jazeera drew attention to recent major combat aircraft purchases by the two states. Al Jazeera reported:

> "At odds for decades, Morocco and Algeria have entered what some see as the fiercest arms race in North Africa in years. In 2006, the Algerian government signed a $1.3bn armament deal with Russia for the delivery of more than 34 MiG-29 fighter jets. Morocco, for its part, has also decided to go shopping for weapons and signed a contract worth $2.4bn to purchase 24 F-16 fighter jets. The ongoing arms race comes against the backdrop of a growing deterioration in the two countries' relations. Algeria's foreign minister rejected a call by Morocco to reopen the borders between the two countries, saying the issue is not a priority for his country. For its part, Morocco accuses Algeria of backing the Polisario front which is fighting for a homeland in Western Sahara, now under Moroccan control" (2008).

These are just several examples helping to illustrate the overall emphasis many states in Africa place upon aerial weaponry and air superiority. Depending on the states

involved, the acquisitions of air combat fighter jets (as well as combat helicopters) may be large or small. Regardless of the size of such expansions and competitions, however, the quest for air superiority and the aerial arms races that often follow as a result appear to be important factors in the military landscape of Africa during my period of study. With this in mind, the last case above involving Morocco and Algeria is an excellent example of not only the relevance of aerial weaponry in Africa but is also a concise reflection of the overall theoretical story of this dissertation: the presence of some contentious issue or issues (a border dispute between Morocco and Algeria) leads to a tit-for-tat arms competition over some period of time (in the case above, Algeria's purchase of a group of fighter jets is followed closely by Morocco's own expansion of its air force).

Hence, it becomes easier to understand the strong association between aerial arms racing and conflict: states in contention with one another likely understand the most efficient means to wage conflict against a competitor state is with aerial means of offensive weaponry. Aerial arms competitions may be less important in the relatively more contained and proximate distances for states in the Middle East (again, where aerial arms races are not statistically significant) where ground based forces can be quickly and effectively deployed across shorter distances. However, the empirical results above suggest a much lower utility for the use of ground based weaponry to carry out militarized conflict over the expansive African continent; it is true African states engage in ground based forms of arms racing but this behavior appears to be

more saber rattling since it is aerial arms races (along with naval races) that much more often than not develop into militarized conflict.[59]

Taken broadly, the empirical results also offer some face validity when considering many of the areas in Africa that have been plagued by militarized conflict in recent history. Although arms racing appears to be relatively widespread throughout Africa there are at least several especially conflict prone areas where arms races should be particularly conspicuous. In northern Africa, Libya, Sudan, and Egypt have been a source of ongoing tension and periodic conflict; Table 6.1 earlier shows serious rivalries between all three states including Libya and Sudan, 1974-1985, Egypt and Libya, 1973-1992, and Egypt and Sudan, 1991 and onward.

Indeed, Libya and Egypt engaged in a naval arms race from 1979-1987 as well as an aerial arms race from 1978-1983. Libya and Sudan undertook arms races both on the ground (1971-1975) as well as in the air (1971-1976 and 1979-1985) and Sudan and Egypt engaged in an extensive aerial arms race from 1988-1997. In west-central Africa Nigeria and Cameroon have experienced repeated militarized conflicts that started in the 1980's. Their violent clashes were due at least in part to the disputed Bakassi peninsula, a resource rich area of land in the Gulf of Guinea that had been administered by Nigeria since it gained independence. Throughout this period of contentious relations both states were involved in ground based arms races from 1974-1978 and 1984-1988 as well as an aerial arms race from 1985-1992.

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[59] A majority of African states are coastal and so the strong relationship between naval arms races and conflict is not surprising. Although many of these navies are not comprised of large war ships or vessels that could be sent across oceans most of these same navies are adequately equipped for coastal offensives with nearby states.

In central Africa, the military junta of Mobutu Sese Seko dominated the leadership of the Democratic Republic of Congo from 1965-1997. The totalitarianism and military rule kept tensions high and plunged the DRC into militarized conflict with many of its neighbors. Issues were key instigators for many of these arms races, none more so than Sese Seko's own fear and international accusations concerning communist expansion (especially the Soviet Union's relationship with Angola). Conversely, many neighboring states held grievances regarding Sese Seko's totalitarian, one-party dictatorship (BBC, 2009). Given these issues that surrounded the central African nations during this period there were various instances of arms racing: the DRC, for example, participated in naval arms racing (1980-1984) and aerial arms racing (1980-1991) with both Congo and Angola and an aerial arms race with Uganda from 1971-1975.

The Horn of Africa continues to exhibit high levels of contention between states as well as frequent episodes of militarized conflict. Though some definitions vary Sudan, Eritea, Ethiopia, Somalia, Uganda, and Kenya are generally considered to be the major inhabitants of this region of eastern Africa. Among these states, serious rivalries have involved Ethiopia and Somalia from 1960-1988, Ethiopia and Sudan since 1965, Kenya and Somalia from 1963-1981, and Kenya and Uganda from 1986-1995. Territorial claims, political dictatorship, and ethnic issues are some of the primary underlying factors that have contributed to the ongoing instability for many of the states in this specific region of Africa.

As a result, there has been a significant amount of military expansion and competition here from the period 1970-2000: between Kenya and Ethiopia a ground

arms race from 1973-1982, a naval arms race from 1984-1991, and an aerial arms race from 1974-1988; Ethiopia and Sudan engaged in aerial arms racing from 1979-1988 and again from 1990-1998; a ground race from 1973-1977 and an aerial arms race from 1973-1978 occurred between Uganda and Kenya; Kenya and Sudan pursued aerial arms races from 1972-1976 and again later from 1985-1992; lastly, an aerial arms race between Kenya and Somalia continued from 1972-1978.

Indeed, both of Africa's interstate wars as listed by the Correlates of War from 1970-2000 involved states located within the Horn of Africa. Militarized conflict erupted between Ethiopia and Somalia in 1977 over the disputed Ogaden region of Ethiopia. In this case, only an aerial arms race was involved beginning in 1977 and lasting until 1987. The data show Ethiopia made reasonably large increases in its ground based military forces along with its air force in the several years leading up to the war; Somalia, however, was able to enlarge only its aerial weaponry immediately before the outbreak of conflict.[60] The second war during this period of time involved Uganda and Tanzania from 1978-1979. In this particular case, no arms racing of any kind preceded the militarized conflict between both states.

Basic accounts suggest rising tension between Uganda and Tanzania began with Idi Amin's rise to power in 1971. Tanzania responded by offering political asylum to the victim of Amin's coup thus setting off the deterioration in relations between the two states. However, the contention between both Uganda and Tanzania during the period

[60] Somali ground forces did show some significant increases in several years after the beginning of the war probably as a response to Ethiopian ground supremacy but was nonetheless unable to match Ethiopian ground fortifications in the several years leading up to the war.

is not reflected in their United Nations ideal point estimates. From 1971 until the outbreak of hostilities the largest difference in UN ideal points is approximately 0.18, still below the overall average distance for Africa of 0.20.

Most surprising, there appears to be little bilateral arms competition between each state during this same period of time. Uganda appears to double its ground based forces and increase slightly its aerial weaponry in the lead up to the war but Tanzania is unable to match these increases in either ground or aerial weaponry. Thus, this specific case does not appear to conform to the theory developed earlier: contentious issues were present (though not captured by United Nations voting) but no extraordinary bilateral arms increases occurred between Uganda and Tanzania. That is, in this particular case, militarized conflict was not preceded by any form of arms racing.

Still, the empirical results provide good support for the claim that arms racing is positively associated with militarized conflict. The discussion above indicates that various types of arms races have indeed occurred across parts of Africa where contentious issues and conflict have been most prevalent. The following section moves towards a substantive examination of arms races and interstate conflict by investigating the likelihood of observing militarized interstate disputes when different types of arms races – ground, sea, and air – are present:

Table 6.5
Probability of Conflict Onset, 1970-2000
Estimates Obtained from Table 6.4

Variable	Treatment	Pr(Conflict Onset)	% Increase
Baseline:			
Arms Race	0		
Contiguity	0	0.1% (0.0002)	-
ln(Capability Ratio)	$\bar{x}$		
Ground Race*	1	0.2% (0.001)	100%
Sea Race	1	0.3% (0.002)	200%
Air Race	1	0.2% (0.001)	100%

Variable	Treatment	Pr(Conflict Onset)	% Increase
Baseline:			
Arms Race	0		
Contiguity	1	3.4% (0.005)	-
ln(Capability Ratio)	$\bar{x}$		
Ground Race*	1	5.0% (0.015)	47%
Sea Race	1	10.4% (0.043)	206%
Air Race	1	7.0% (0.017)	106%

*estimated coefficients not significant

The top portion of Table 6.5 reports the baseline probability of a MID in Africa from 1970-2000 when the capability ratio is set to its mean and when there is no direct contiguity and no arms racing present. Under these conditions, there is only one-tenth of 1% likelihood for conflict – that is, virtually no chance at all. This figure is especially low due to the large number of potential dyadic relationships for each state in Africa over the thirty year period 1970-2000 and the relatively small number of MID incidents (183). Thus, while the presence of a naval arms race produces a 200% increase in the probability of interstate conflict over the baseline probability the overall likelihood of conflict is still just three-tenths of 1%, or 0.3%. Similarly, an aerial arms race makes

interstate conflict 100% more likely but produces an overall probability of only two-tenths of 1%. Additionally, I report the effects for ground based arms racing though it should be noted this particular arms race variable does not reach any level of statistical significance and therefore the substantive effects above should not be taken with much confidence.

The potential effects change significantly, however, when direct contiguity it present. Using this model specification, the baseline probability of observing a militarized interstate dispute is approximately 3.4%. When African states engage in naval arms racing the overall probability of interstate conflict is 10.4%, a 206% increase over the baseline probability. Aerial arms races also exhibit a strong impact as they produce a 106% increase in the likelihood of militarized conflict for an overall chance of 7%. Again, ground based arms races make interstate conflict more likely but because the coefficient estimate is not significant its impact on conflict propensity cannot be readily accepted.

Since coefficients obtained from a logistic regression analysis only suggest the direction of the impact (positive or negative) I refer to substantive impacts of an arms race as the actual affect on the likelihood two states will experience conflict. The substantive impacts presented above suggest a similar story as in the Middle East. Recall that in the Middle East, the actual probability of militarized conflict was higher in the presence of an arms race and contiguity than with an arms race and no contiguity. For example, a ground race between non-contiguous states produced a 4.2% probability of an MID while a ground race coupled with contiguity increased this likelihood to

16.1%. Although for Africa over the same time period I find similar results the overall likelihood for interstate conflict is dramatically higher when arms racing occurs in conjunction with direct contiguity. Table 6.5 above shows naval arms races involving non-contiguous states have a likelihood of producing conflict of just one-third of 1%. When these states are contiguous, however, the probability of militarized conflict jumps to 10.4%, or more than thirty times more likely.

This regional variation in substantive impacts is provocative because it shows the effects of arms racing in the presence of direct contiguity is weaker in the Middle East but much stronger in Africa. One potential explanation for this finding is consistent with a theme explored earlier in this chapter: interstate distances and the sheer size of the African region may mean that while arms racing (naval and aerial) is positively associated with militarized conflict they are only especially conflict prone when states are actually near (contiguous) with one another. So while contiguity does increase the impact of arms racing on the outbreak of conflict in the Middle East is appears to be a much stronger conduit for conflict in Africa.

6.5 Summary and Conclusions

In this chapter I have presented and discussed the empirical results for Hypothesis 1 – the impact of arms races on conflict onset – for the region of Africa, 1970-2000. Having explored and empirically evaluated two of the three regions originally proposed some encouraging patterns and thought-provoking findings have begun to emerge. First, I find good support again for my central thesis regarding the

relationship between arms racing and interstate conflict. In Africa, I find that it is naval and aerial arms racing that positively associated with militarized conflict at statistically significant levels. It is important to note African states also engage in ground based arms racing; however, even though the ground race variable's estimated coefficients is positive and in the expected direction it does not reach any appreciable level of statistical significance and as a result I cannot reject the null hypothesis for ground based arms racing and its effect on interstate conflict.

Above all, empirical results obtained over two regions now (the Middle East and Africa) seem to offer some justification for studying separate forms of arms racing and through a regional analysis. In the Middle East it was ground based and naval based arms races that were positively associated with militarized conflict with aerial arms races failing to reach a statistically significant effect. Empirical results obtained for the region of Africa in this chapter, however, indicate little relationship between ground based arms racing and conflict but positive and statistically significant associations between both naval and aerial arms races and interstate conflict. One possible explanation for this regional variation proposed earlier involves the relatively large expanse of the African continent which perhaps makes aerial weaponry a more efficient means by which to conduct militarized conflict.

Similarly, besides the actual variation in the statistical relationship between different forms of arms racing and conflict there are important differences in the generated predicted probabilities (substantive effects) across regions so far. Whereas the presence of direct contiguity increased the impact of arms races upon conflict in the

Middle East the effect is much stronger for the African region. Here, arms races[61] increase the likelihood of militarized conflict but the effect is noticeably more powerful with direct contiguity. This means arms races are especially pernicious when states are contiguous with one another in Africa. Again, a finding that is perhaps consistent with the reality of Africa's vast size but a finding that is nonetheless possible only through individual analyses of specific forms of arms racing over individual regions of minor powers.

The final empirical task involves an exploration of arms racing and interstate conflict in the region of Latin America during 1970-2000 in chapter seven that follows. Once again, the theoretical expectations do not change: I assume issues drive extraordinary bilateral arms increases between states and arms races to increase the likelihood of militarized conflict amongst states in Latin America. If the empirical results to this point are any indication, however, there may be interesting variations between the individual arms race variables themselves and their statistical and substantive relationships with militarized conflict.

[61] By arms races I am referring to naval and aerial arms races, the arms race variables that are statistically significant for my model of interstate conflict in Africa.

Appendix 6A
List of Countries

Africa, 1970-2000	
Algeria	Lesotho
Angola	Libya
Benin	Mauritania
Burkina Faso	Madagascar
Botswana	Mauritius
Burundi	Malawi
Cameroon	Mali
Cape Verde	Morocco
Ivory Coast	Mozambique
Central African Republic	Namibia
Chad	Nigeria
Congo	Niger
Djibouti	Rwanda
Democratic Republic of	South Africa
Congo	Senegal
Egypt	Seychelles
Equatorial Guinea	Sierra Leone
Eritea	Somalia
Ethiopia	Sudan
Gabon	Tanzania
Gambia	Togo
Ghana	Tunisia
Guinea-Bissau	Uganda
Guinea	Zambia
Kenya	Zimbabwe
Liberia	

Appendix 6B
List of Arms Race, 1970-2000

Dyad	Ground	Sea	Air	All
Guinea-Bissau – Cameroon	1983-1988			
Guinea-Bissau – Angola		1980-1984		
Guinea-Bissau – Congo		1980-1984		
Guinea-Bissau – Ethiopia		1980-1984		
Guinea-Bissau – Libya		1980-1984		
Guinea-Bissau – Malawi	1984-1988			
Mali – Ivory Coast	1973-1977		1983-1989	
Mali – Angola			1982-1990	
Mali – Nigeria	1973-1978			
Mali – Congo	1976-1981		1982-1986	
Mali – Kenya	1973-1978		1973-1977 1985-1990	
Mali – Ethiopia	1978-1982		1982-1988	
Mali – Mozambique	1978-1983		1982-1988	
Mali – Libya	1973-1978		1973-1977 1982-1986	
Mali – Tunisia			1973-1977	
Senegal – Algeria			1982-1987	
Senegal – Angola			1979-1991	
Senegal – Benin	1980-1986			
Senegal – Congo	1980-1984		1979-1991	
Senegal – Ethiopia			1980-1988	
Senegal – Kenya			1985-1991	
Senegal – Libya			1979-1986	
Senegal – Madagascar			1981-1985	
Senegal – Mozambique	1979-1984		1982-1988	
Benin – Mauritania	1980-1984			

Dyad	Ground	Sea	Air	All
Benin – Togo	1980-1986			
Benin – Cameroon	1982-1987			
Benin – Nigeria	1980-1984			
Benin – Gabon	1980-1984			
Benin – Chad	1984-1988			
Benin – Kenya	1980-1984			
Benin – Tanzania	1980-1984			
Benin – Rwanda	1982-1988			
Benin – Somalia	1980-1984			
Benin – Mozambique	1980-1984			
Benin – Zambia	1980-1984			
Benin – Malawi	1984-1988			
Benin – Botswana	1983-1987			
Benin – Tunisia	1983-1988			
Mauritania – Congo	1976-1984			
Mauritania – Ghana			1990-1994	
Mauritania – Ethiopia	1977-1982			
Mauritania – Mozambique	1978-1984			
Mauritania – Libya	1978-1981			
Mauritania – Sudan			1990-1994	
Niger – Congo	1980-1984			
Niger – Ethiopia	1977-1982			
Niger – Mozambique	1978-1984			
Niger – Libya	1977-1982			
Ivory Coast – Algeria		1975-1979	1983-1987 1996-2000	
Ivory Coast – Angola		1984-1988	1983-1989	
Ivory Coast – Guinea	1971-1977			
Ivory Coast – Nigeria	1972-1977	1975-1979	1983-1989	
Ivory Coast – Congo	1976-1981			

Dyad	Ground	Sea	Air	All
Ivory Coast – Dem. Rep. Congo	1971-1975			
Ivory Coast – Uganda	1972-1977			
Ivory Coast – Kenya	1973-1977			
Ivory Coast – Somalia	1971-1975		1983-1987	
Ivory Coast – Ethiopia	1973-1982	1984-1988	1983-1988	
Ivory Coast – Mozambique	1978-1983		1983-1989	
Ivory Coast – Tunisia	1971-1976		1996-2000	
Ivory Coast – Libya	1971-1982	1975-1981		
Ivory Coast – Sudan	1971-1975		1983-1989	
Ivory Coast – Zambia			1985-1989	
Ivory Coast – Zimbabwe			1984-1989	
Guinea – Angola		1980-1984	1979-1991	
Guinea – Congo		1980-1984	1979-1983	
Guinea – Morocco			1971-1979	
Guinea – Nigeria	1973-1977			
Guinea – Dem. Rep. Congo	1971-1975		1971-1975	
Guinea – Ethiopia		1980-1984	1979-1983	
Guinea – Kenya	1973-1977		1972-1976 1985-1992	
Guinea – Tunisia	1971-1975		1971-1976	
Guinea – Libya	1971-1977	1980-1984	1971-1983	
Guinea – Sudan			1988-1992	
Ghana – Algeria		1972-1976		
Ghana – Angola		1980-1985	1977-1982 1986-1991	
Ghana – Congo	1976-1981	1980-1985	1978-1982	1980-1981
Ghana – Ethiopia	1976-1982	1979-1984	1977-1982	1979-1982
Ghana – Malawi			1989-1993	

Dyad	Ground	Sea	Air	All
Ghana – Mozambique	1978-1983		1978-1982	
Ghana – Kenya			1986-1992	
Ghana – Libya	1977-1982	1977-1985	1977-1982	1977-1982
Ghana – Uganda			1974-1978	
Togo – Angola			1986-1991	
Togo – Congo	1976-1984		1987-1991	
Togo – Ethiopia	1976-1981			
Togo – Mozambique	1979-1984			
Togo – Sudan			1988-1992	
Cameroon – Algeria			1983-1987	
Cameroon – Angola		1980-1987	1983-1991	
Cameroon – Ethiopia		1980-1987	1983-1987	
Cameroon – Nigeria	1974-1978 1984-1988		1985-1992	
Cameroon – Congo	1980-1984	1980-1987	1987-1991	
Cameroon – Kenya	1974-1978		1985-1992	
Cameroon – Mozambique	1980-1984		1983-1990	
Cameroon – Zimbabwe	1982-1988		1985-1990	
Cameroon – Malawi	1984-1988			
Cameroon – Madagascar	1983-1988			
Cameroon – Seychelles	1983-1988			
Cameroon – Somalia			1983-1987	
Cameroon – Sudan			1983-1991	
Cameroon – Libya	1974-1978	1980-1987		
Nigeria – Angola		1980-1986	1979-1991	
Nigeria – Congo	1976-1984	1980-1986	1979-1986	1980-1984

Dyad	Ground	Sea	Air	All
Nigeria – Dem Rep. Congo	1974-1978			
Nigeria – Uganda	1972-1977			
Nigeria – Ethiopia	1977-1982	1979-1986	1979-1988	1979-1982
Nigeria – Kenya			1985-1992	
Nigeria – Mozambique	1978-1984		1982-1988	
Nigeria – Malawi	1984-1988			
Nigeria – Madagascar	1984-1990			
Nigeria – Libya	1977-1982	1977-1986	1979-1986	1979-1982
Nigeria – Sudan			1984-1992	
Gabon – Algeria			1982-1987	
Gabon – Angola		1981-1986	1981-1991	
Gabon – Congo	1980-1984	1981-1986	1981-1991	1981-1984
Gabon – Ethiopia		1979-1986	1982-1988	
Gabon – Kenya			1985-1992	
Gabon – Libya		1979-1986	1981-1986	
Gabon – Madagascar			1981-1985	
Gabon – Mozambique	1979-1984		1982-1988	
Gabon – Sudan			1988-1992	
Cen. African Rep. – Madagascar	1983-1988			
Chad – Angola			1986-1991	
Chad – Congo			1987-1991	
Chad – Kenya			1986-1992	
Chad – Madagascar	1984-1990			
Chad – Seychelles	1984-1990			
Chad – Sudan			1988-1992	
Congo – Botswana			1987-1991	
Congo – Dem. Rep. Congo		1980-1984	1980-1991	
Congo – Egypt		1982-1987	1978-1983 1987-1991	
Congo – Kenya	1976-1984		1978-1991	
Congo – Tanzania	1976-1984		1980-1986	
Congo – Somalia	1980-1984		1979-1986	
Congo – Zambia	1980-1984		1978-1985	

Dyad	Ground	Sea	Air	All
Congo – Malawi	1976-1981			
Congo – Morocco	1976-1981	1980-1987	1978-1986	1980-1981
Congo – Sudan			1979-1985	
Congo – Tunisia	1976-1980	1980-1986	1981-1991	
Congo – Zimbabwe			1981-1986	
Dem. Rep. Congo – Angola		1980-1984	1980-1991	
Dem. Rep. Congo – Egypt			1971-1975	
Dem. Rep. Congo – Ethiopia		1979-1984		1980-1982
Dem. Rep. Congo – Kenya	1974-1978		1973-1978 1987-1992	
Dem. Rep. Congo – Somalia	1971-1975		1971-1975	
Dem. Rep. Congo – Ethiopia	1978-1982		1980-1988	
Dem. Rep. Congo – Morocco			1971-1975	
Dem. Rep. Congo – Madagascar			1980-1985	
Dem. Rep. Congo – Mozambique	1978-1982		1984-1988	
Dem. Rep. Congo – Tunisia	1971-1975		1971-1977	
Dem. Rep. Congo – Libya	1971-1982	1979-1984	1971-1985	1979-1982
Dem. Rep. Congo – Sudan	1971-1975		1971-1975 1984-1992	
Dem. Rep. Congo – Uganda			1971-1975	
Dem. Rep. Congo – Zimbabwe			1984-1991	
Uganda – Egypt			1971-1978	
Uganda – Kenya	1973-1977		1973-1978	
Uganda – Burundi	1995-2000			
Uganda – Morocco			1971-1975	
Uganda – Tunisia	1972-1976		1971-1977	

Dyad	Ground	Sea	Air	All
Uganda – Libya	1972-1977		1971-1978	
Kenya – Burundi			1985-1989	
Kenya – Angola		1984-1989	1977-1991	
Kenya – Botswana			1987-1992	
Kenya – Algeria			1972-1976 1982-1987	
Kenya – Ethiopia	1973-1982	1984-1991	1974-1988	
Kenya – Egypt			1972-1976 1986-1992	
Kenya – Sudan			1972-1976 1985-1992	
Kenya – Madagascar			1980-1984	
Kenya – Mozambique	1978-1984		1978-1990	
Kenya – Malawi	1976-1981			
Kenya – Libya	1973-1982		1972-1986	
Kenya – Morocco			1985-1989	
Kenya – Tunisia			1985-1992	
Kenya – Somalia			1972-1978	
Kenya – Zambia			1972-1978 1985-1990	
Kenya – Zimbabwe			1985-1991	
Tanzania – Angola			1980-1986	
Tanzania – Ethiopia	1978-1982	1979-1983	1980-1986	1980-1982
Tanzania – Libya			1980-1986	
Tanzania – Mozambique	1978-1984		1982-1986	
Tanzania – Malawi	1976-1981			
Burundi – Angola	1995-2000		1985-1989	
Burundi – Ethiopia			1993-1998	
Burundi – Rwanda			1993-1998	
Burundi – Botswana			1993-1998	
Burundi – Egypt			1992-1998	
Burundi – Morocco			1992-1996	
Burundi – Sudan			1990-1998	
Burundi – Tunisia			1994-1998	

Dyad	Ground	Sea	Air	All
Burundi – Zimbabwe			1993-1998	
Rwanda – Madagascar	1983-1989			
Rwanda – Sudan			1993-1998	
Somalia – Angola			1979-1987	
Somalia – Ethiopia			1977-1986	
Somalia – Morocco			1971-1975	
Somalia – Mozambique	1979-1984		1982-1987	
Somalia – Tunisia	1971-1975		1971-1977	
Somalia – Libya	1971-1975	1978-1983	1971-1986	
Ethiopia – Zambia	1978-1982		1978-1984	
Ethiopia – Malawi	1976-1981			
Ethiopia – Morocco	1976-1982	1980-1987	1975-1988	1980-1982
Ethiopia – Tunisia	1976-1982	1979-1986	1982-1988	1982
Ethiopia – Libya	1973-1978		1974-1978	
Ethiopia – Zimbabwe			1982-1988	
Ethiopia – Sudan			1979-1988 1990-1998	
Ethiopia – Egypt		1979-1987	1978-1983	
Mozambique – Egypt			1978-1982	
Mozambique – Zambia	1978-1984		1978-1982	
Mozambique – Morocco	1978-1983		1978-1988	
Mozambique – Zimbabwe			1982-1988	
Mozambique – Algeria	1978-1983		1978-1987	
Mozambique – Sudan			1983-1988	
Mozambique – Tunisia	1978-1983		1982-1988	
Zambia – Libya	1978-1982		1972-1985	
Zambia – Morocco			1975-1979	
Zambia – Tunisia			1972-1977	

Dyad	Ground	Sea	Air	All
Zimbabwe – Algeria			1996-2000	
Zimbabwe – Libya			1981-1986	
Zimbabwe – Malawi	1984-1988			
Zimbabwe – Sudan			1993-1998	
Malawi – Madagascar	1984-1988			
Malawi – Seychelles	1984-1988			
Malawi – Algeria	1977-1981			
Malawi – Tunisia	1984-1988			
Malawi – Libya	1976-1981			
Madagascar – Tunisia	1983-1988			
Madagascar – Morocco			1980-1985	
Morocco – Algeria	1977-1983		1976-1987	
Morocco – Libya	1976-1982	1980-1987	1971-1986	1980-1982
Morocco – Sudan			1971-1975 1992-1996	
Tunisia – Libya	1971-1982	1977-1986	1971-1975 1981-1986	1981-1982
Tunisia – Sudan	1971-1975		1971-1976 1988-1992 1994-1998	
Libya – Egypt		1979-1987	1978-1983	
Libya – Sudan	1971-1975		1971-1976 1979-1985	
Angola – Zambia			1977-1990	
Angola – Zimbabwe			1981-1991	
Angola – Botswana			1987-1991	
Angola – Madagascar			1980-1984	
Angola – Morocco		1980-1987	1978-1989	
Angola – Algeria			1977-1987	
Angola – Tunisia		1980-1986	1981-1991	
Angola – Sudan			1979-1991	

Dyad	Ground	Sea	Air	All
Angola – Egypt		1982-1987	1978-1991	
Botswana – Madagascar	1983-1987			
Botswana – Sudan			1988-1998	
Algeria – Tunisia		1972-1976	1972-1976 1982-1987	
Algeria – Libya			1972-1976	
Algeria – Egypt		1979-1983	1972-1976 1978-1983	
Sudan – Egypt			1988-1997	

Chapter 7

Arms Racing and Conflict in Latin America

7.1 Introduction

This chapter represents the final test of my theory involving arms racing and international conflict amongst minor power states. As I have done previously, I begin with an overview of the Latin American region describing some of the major interstate rivalries and the prevalence of militarized interstate disputes from 1970-2000. I then report empirical results for Hypothesis 1 – the central theoretical research question – and discuss these statistical relationships as well as the substantive impacts of arms races on the probability of conflict onset. The remainder of chapter seven utilizes recent examples of how arms races have developed and affected the relations of Latin American states over time. In the concluding chapter that follows I summarize the statistical findings from all three empirical chapters in an effort to identify some broad patterns and suggest some conclusions about the relationship between arms races and militarized conflict.

7.2 Latin America, 1970-2000

I investigate the region of Latin America stretching from Mexico, through Central America, and including the South American continent.[62] The full list of states comprising Latin America I analyze can be found in Appendix 7A at the end of this chapter. The region of Latin America, much like the previous two regions of the Middle East and Africa, contains a group of minor power states that have also experienced interstate rivalries with one another. Revisiting Thompson's (2001) list of strategic rivals shows there were eleven rivalry cases over the period 1970-1999, the final year of his data. Table 7.1 below lists the eleven rivalries in which both states were located regionally in Latin America along with the years active for each rivalry:

Table 7.1
Rivalries of Latin America, 1970-1999

Rivalry	Years Active
Argentina – Brazil	1817-1985
Argentina – Chile	1843-1991
Belize – Guatemala	1981-1993
Bolivia – Chile	1836-
Colombia – Nicaragua	1979-1992
Colombia – Venezuela	1831-
Costa Rica – Nicaragua	1948-1992
Ecuador – Peru	1830-1998
El Salvador – Honduras	1840-1992
Guyana – Venezuela	1966-
Honduras – Nicaragua	1980-1987

[62] Though some classifications include Caribbean nations as part of Latin America I do not include these states in my analysis.

The table above reveals Latin America to be the region least plagued by serious interstate rivalry, at least during the period 1970-1999; although containing approximately one-third more states than the Middle East nations located within Latin America experienced about half the number of rivalries as did occur in the Middle East, the smallest region of my study. Still, there have been important and some particularly long standing rivalries in Latin America. Argentina and Brazil were involved in a rivalry lasting well over one hundred fifty years from 1817-1985. Similarly, Argentina and Chile engaged each other in a rivalry from 1843-1991. There are two rivalries – Bolivia and Chile along with Colombia and Venezuela – that originated in the early nineteenth century and as of 1999 are still ongoing. Two other rivalries between Ecuador and Peru and El Salvador and Honduras also stem from the nineteenth century but have only recently ended in 1998 and 1992, respectively.

Consistent with the previous two regions analyzed I use MID version 3.04 and count the total number of MIDs in Latin America in which there was at least one Latin American state on both sides. An examination of MID version 3.10 shows no pertinent differences between the data sets such as the addition or subtraction of disputes. Moving along there were 68 militarized interstate disputes in Latin America during the period 1970-2000. Calculated as MIDs per year, this equates to approximately 2.3 interstate disputes per year over my thirty year period of study. This is by far the fewest number of interstate conflicts out of the three regions included in this study even though Latin America itself contains the second most number of sovereign states. The relatively low number of interstate disputes is consistent with the broader assertion that

Latin America has, in fact, been a region especially free of *inter*state conflict in the twentieth century. That is to say, much of Latin America's conflict has occurred domestically through civil conflicts, violent political revolutions, and intrastate conflicts between rebel guerrilla groups and even violent drug cartels (particularly in specific Latin American states). In his work on power transition and war amongst minor power states, Lemke (2002) similarly notes:

> "The reason [for peace] is South America more convincingly fits the pattern of state development and interstate conflict...South American states frequently fought wars in the nineteenth century, and seemed to do so to decide where their borders would be, who could control mineral resources, who would have access to important waterways, etc. Those issues have been resolved and South America's states are much more established than are Africa's. Further, power relationships in South America are more stable than in Africa, and not surprisingly war has become rare" (162).

Correspondingly, the Correlates of War Interstate War Data (v3.0) shows no wars between strictly Latin American states in the region during my period of study. The Falklands War was fought was off the coast of Argentina in and around the Falklands Islands but involved Argentina and the United Kingdom and, thus, was not a war between two Latin American states.[63] Finally, an analysis of the Correlates of War military expenditures data shows that the Latin American region accounted for approximately 1.1% of the total global military expenditures for the year 1985 and by comparison is significantly less than NATO's 43% proportion of total global military expenditures. Of the three regions in this study, Latin America's proportion of global expenditures is less than both Africa (1.7%) and the Middle East (8.1%).

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[63] The Football War between El Salvador and Honduras, however, was fought in the summer of 1969 just before the beginning of my temporal domain.

7.3 Descriptive Statistics

The first descriptive statistic I report is the distribution of arms races by weapons category. During the period 1970-2000 there are 49 ground based arms races, 13 naval arms races, and 71 aerial arms races between states in Latin America. Latin America also contains two landlocked states, Bolivia and Paraguay. As with Africa, aerial arms races outnumber ground based arms races in Latin America – a relatively large region itself – while naval arms racing is the most infrequent form of arms competition. Table 7.2 below displays the correlation matrix for the ground, naval, and aerial arms race variables as well as both contiguity and capability ratio controls. Although not as many as Africa, Latin America's two landlocked states of Bolivia and Paraguay are excluded from all correlations that involve the naval arms race variable. Thus, the following table again contains two separate correlations. All correlation cells below involving the 'Sea' variable have been calculated by excluding the landlocked states of Bolivia and Paraguay and results in the smaller N of 4449 as listed underneath Table 7.2. All other cells are produced using the full number of observations:

Table 7.2
Pearson Correlation Coefficients for Ground, Sea, and Air Arms Racing

Model Variables	Ground	Sea	Air	Contiguity	ln(Capability Ratio)
Ground	1.00	0.07	0.25	–0.03	–0.09
Sea		1.00	0.21	0.03	–0.07
Air			1.00	–0.02	–0.08
Contiguity				1.00	–0.03
ln(Capability Ratio)					1.00

N = 5563, 4449

The correlation coefficients shown above for the three arms race variables are similar to correlations reported earlier for the regions of Africa and the Middle East. There is nearly no correlation between ground and naval arms racing (r = 0.07) and some moderate correlation between naval and aerial arms racing at 0.21. Although not extremely high, ground based arms races and aerial arms races exhibit the highest level of correlation at 0.25. This means for two of the three regions included in this dissertation ground arms races and air arms races are the highest correlated arms race variables: the Middle East (r = 0.39) and Latin America (r = 0.25); in Africa, ground and aerial arms races produce the second highest correlation (r = 0.24). Finally, I provide some very general statistics indicating the likelihood any state in Latin America will increase its weapons from one year to the next in an effort to shed some insight on the overall arming patterns of Latin American states during my period of study:

Table 7.3
Likelihood of Increasing Arms in Following Year

Arms Type	Increase in Arms at *t+1*
Ground	48%
Sea	29%
Air	48%

N = 5563, 4991

In Table 7.3 each percentage figure indicates the likelihood that any state in Latin America increased a specific form of weaponry over the span of one year. Since I remove landlocked states from my analysis of yearly changes in naval weaponry this percentage is obtained over a smaller set of observations (4991). The percentages above indicate a Latin American state on average increased its naval weapons 29% of the time. The percentage of states that increased either their ground or aerial weaponry from one year to the next is the same at 48%. Hence, as do states in the Middle East and Africa states in Latin America increase their weapons from year to year with some frequency.

7.4 Empirical Results: Hypothesis 1

H1: *The presence of an arms race increases the likelihood of international conflict.*

The following table reports coefficient results for the estimated impact of arms racing on militarized conflict. I test the same theoretical argument applied to the previous two regions of the Middle East and Africa: the presence of an arms race should increase the chances for interstate conflict amongst states in Latin America. I again estimate three separate empirical models in an effort to observe the individual impact

of ground, naval, and aerial arms racing on conflict. Once again, the relationship between naval arms racing and conflict is estimated without the two landlocked states of Bolivia and Paraguay. In addition, I utilize all potential observations (not just the subset of cases in which tension or arms races are present) in each statistical model below:

Table 7.4
Multivariate Models for Conflict Onset
Three Types of Arms Racing, 1970-2000

Variable	Model 1 Ground Races	Model 2 Sea Races	Model 3 Air Races
Arms Race Type	0.261 (0.530)	0.815 (0.831)	0.744 (0.457)*
Contiguity	3.848 (0.781)***	3.779 (0.777)***	3.852 (0.776)***
ln(Capability Ratio)	−0.268 (0.084)**	−0.211 (0.112)**	−0.277 (0.146)**
Constant	−4.928 (0.293)	−4.847 (0.750)	−4.977 (0.743)
N	5562	4448	5562
Log-likelihood	−229.32	−215.48	−227.65
Pseudo-R^2	0.368	0.373	0.372

*p ≤ .10, **p ≤ .05, ***p ≤ .01, robust standard errors in parentheses

The statistical results above for the region of Latin America are considerably different than the results reported for Hypothesis 1 in both chapter five and six. First, of the three primary arms race variables only one type of arms race achieves some level of statistical significance with militarized conflict; Table 7.4 shows that aerial arms racing has a positive effect upon interstate conflict at the p ≤ .10 level of significance. Recall earlier Latin American states engage in all three types of arms racing with one another –

especially ground and aerial – but these results suggest that only aerial arms races are reasonably likely to end in interstate conflict.

Indeed, aerial arms competitions are the most common form of arms races in Latin America and the only form of arms racing that has a positive and statistically significant effect on conflict onset. The data show aerial arms races between states known to have experienced strained relations such as Peru and Bolivia (1973-1977), Peru and Chile (1973-1979), Venezuela and Chile (1989-1993), and Mexico and Guatemala (1981-1986), amongst others. Furthermore, the importance and use of aerial weaponry such as fighter/bomber aircraft and combat helicopters in Latin America is evident in past and current events.

For example, the pursuit of air superiority can be observed in the historically fragile relations between Honduras and Nicaragua. Recurrent disputes over their respective rights to a certain area of fishing waters along their Caribbean border have involved air force expansion attempts by both states. This border dispute between Honduras and Nicaragua was further complicated in the 1980's; Honduras desired 12 F-5E fighters in order "...to offset the growing helicopter fleet of Nicaragua, its neighbor" whereas the Reagan Administration preferred to provide Honduras with the jets but for the purposes of fighting against Nicaragua's Sandinista rebels (Sciolino, 1987).

The New York Times addressed clearly the potential for both states to become involved in an aerial arms race by noting: "The proposed sale...is expected to meet stiff opposition from members of Congress who question the American role in Central America and argue that such a sale would set off a regional arms race...Several members

of Congress have argued that the sale of the planes would provide Nicaragua with justification for obtaining MiG fighters from the Soviet Union" (Sciolino, 1987). One month after the original proposal the Senate Foreign Relations Committee voted 10-9 in June, 1987, to reject the proposed sale of F-5E combat aircraft to Honduras in order to avert "...a stepped-up arms race in Central America...Senator Christopher J. Dodd...the sponsor of the resolution, said the F-5's would...encourage Nicaragua to seek Soviet jet fighters" (Associated Press, 1987).

Nonetheless, border tensions have persisted between Honduras and Nicaragua along with fears and suspicions regarding the acquisition and use of air weaponry. In a recent story about their shared border dispute Reuters describes how the pursuit of air superiority can place others on high alert: "Relations between Nicaragua and Honduras have been strained anew in recent months after Honduras said it would buy planes with U.S. aid, for use in hunting drug smugglers. Although Honduras told Nicaragua the planes were not a military threat, Nicaragua has insisted on keeping old anti-aircraft missiles to defend against its neighbor" (2007). Hence, this specific storyline involving Honduras and Nicaragua is a pertinent example of the role of combat aircraft in Latin America and plainly illustrates how political leaders understand the ease by which states can become involved in aerial arms races, for instance.

More currently, a 2008 crisis between Colombia and Ecuador involved the use of strategic airstrikes by the Colombian air force against insurgent FARC targets located within Ecuadorian borders. Colombia's aerial invasion of Ecuador in turn entangled Venezuela's Hugo Chavez into his own tense border confrontation with the Colombian

government. Even before this most recent crisis Venezuela has been an active buyer of Soviet advanced combat aircraft. In 2006, the Chavez government took delivery of 24 Sukhoi Su-30MK2 combat jets from Russia. In addition, the aerospace and defense analysis group Forecast International also noted "There has been an application, but no contract yet, for the purchase of Russian Mi-28 Night Hunter combat helicopters" (2008: 5).

Venezuela's emphasis on air force expansion has triggered fears in Brazil, as well. The Brazilian government has resurrected its original FX plan for air force expansion (now deemed FX-2) and is in negotiations with several contractors for approximately 36 new combat fighters, or about $2.2 billion in air force defense spending. Forecast International (2008) explains: "Brazil is also concerned by neighboring Venezuela's rapid build-up of new fighters and helicopters. Recent Brazilian procurement activity has been the $60 million, five-year lease of 12 ex-French air force Mirage 2000C/Bs, the last of which arrive this year [2008]. Embraer is also upgrading the air force's Northrop F-5E/Fs and AMX strike aircraft" (3).

With respect to Peru, Forecast International reports "The air force acquired RSK MiG-29 fighters and Sukhoi Su-25 attack aircraft from surplus Belarus stocks in 1996-1998, a move that sparked the last Latin American arms race and prompted neighboring Chile's purchase of F-16s" (2008: 5). Reflecting Latin America's recent flurry of air force expansions a Bloomberg news Latin American correspondent writes that "Latin American countries have gone on a military spending spree in recent years...Regional arms spending jumped 55 percent over four years to $38.4 billion in 2007, according to

the International Institute of Strategic Studies. The buildup comes amidst increased regional rivalries" (Walter, 2008).

So although there is a statistically significant relationship between aerial arms racing and militarized conflict in Latin America there does not appear to be much of a relationship between the other two primary arms race variables. Even though both coefficients are in the expected direction, neither ground based nor naval arms races reach any acceptable level of statistical significance with militarized conflict. There are at least two likely reasons for the lack of statistical significance between ground arms races, naval arms races, and conflict.

First, the relatively small number of interstate militarized disputes between Latin American states means cases in which ground and naval arms races did not lead to conflict are much more likely to affect the estimated coefficient such that a weak to negligible relationship is produced. Looking at the actual data reveals most Latin American states engage in only one form of arms racing most of the time and that when conflict *is* preceded by an arms race it is more often than not an aerial arms race. Although this again shows the important role aerial weaponry plays in Latin America (as discussed above) this fact also helps to explain the null finding between ground based and naval based arms racing, and militarized conflict.

Second – and perhaps most interesting – are the statistical associations between the control variables and the likelihood of conflict in each of the models estimated in Table 7.4. Just the same as both the Middle East and Africa, direct contiguity is shown to have a strong positive and statistically significant relationship with conflict in Latin

America. In fact, this relationship holds for all three regions at $p \leq .01$. However, for the first time the capability ratio of states produces a coefficient both in the expected direction (negative) and statistically significant. This means that as the disparity in power between a pair of states increases the likelihood of conflict between them decreases (or, as parity increases the chances for conflict increases) and is consistent with the theoretical expectation presented in chapter three. Yet, while the coefficient estimates for capability ratio were in the anticipated direction for both the Middle East and Africa they were not significant at any level; in Latin America, power capability is now significant ($p \leq .05$) across all four models.

Hence, the robustness of direct contiguity along with power a/symmetry is probably also 'to blame' for the lack of any relationship between ground and naval arms racing with conflict onset (as well as the relatively weak relationship between aerial/simultaneous arms racing and conflict). Given the overall low levels of interstate conflict (MIDs) in Latin America and the strong influence of both contiguity and dyadic power distribution it seems there is simply too little remaining variation to be predicted (in general) by arms racing.

Now, simply because there is a relative scarcity of militarized conflict in Latin America does not by definition mean the arms race variables should perform poorly in predicting instances of conflict onset. However, since both control variables are exhibiting strong statistical effects it may very well be the case that both of these covariates have monopolized a majority of the variance in the outcome variable (conflict onset) which, ultimately, could contribute to the rather weak effects of the actual arms

race variables. Thus, while it is true Latin American states engage in all three types of arms racing with one another as a whole the presence of arms races do not appear to impact the likelihood of militarized conflict very much at all.

Even in the face of these generally weak results there are still some especially contentious relationships between Latin American states that have involved arms competitions. One of the longer standing rivalries in Latin America involves Argentina and Chile from 1843-1991. During the 1970's and early 1980's both states engaged in repeated militarized conflicts primarily due to the ongoing Beagle dispute involving a group of islands along the southern cone of South America that offer strategic access between the Atlantic and Pacific Oceans.[64] Indeed, Argentina and Chile were involved in all three forms of arms racing during this time: a ground race from 1972-1977, a naval arms race from 1974-1980, and an aerial arms race from 1972-1980.

Another serious and lengthy contentious relationship existed between Ecuador and Peru from 1830-1998. Relevant to my specific period of study, border disputes plagued both nations during the late 1970's. These resulted in several episodes of militarized conflict including the Paquisha Indicent of 1980 in which Ecuador established several military outposts along its eastern mountainous border with Peru. Here again, arms racing occurred across all three types of weaponry with ground racing occurring between 1973-1978, naval arms racing between 1971-1975, and an aerial arms race from 1973-1979. Although some political disputes regarding the territory endured after the culmination of the Paquisha Incident an informal agreement was reached to draw

[64] For the complete text of the arbitration and treaty between Argentina and Chile regarding the Beagle Channel conflicts please see: http://untreaty.un.org/cod/riaa/cases/vol_XXI/53-264.pdf.

down both states' military forces. My data indicate no further arms racing between Peru and Ecuador after this point.

While these cases provide some good substantive examples of arms races and conflict there are still many other cases in which arms races did not lead to militarized conflict between the participants which, as a result, contributes to the overall weak statistical results obtained for the relationship between arms racing and interstate conflict in Latin America. For example, I find no instances of arms racing of any kind (during my period of study) between El Salvador and Honduras even though both states have experienced repeated disputes from 1840-1992. Thus, even though I do not find a strong relationship between arms racing and conflict (when taken as a whole) I do find a statistically significant relationship between one specific type of arms racing – aerial – and the likelihood of militarized conflict. With the statistical results from Table 7.4 I can calculate substantive effects in the form of predicted probabilities that will indicate how much more likely interstate conflict is to occur when Latin American states are involved in an arms race. The following table therefore presents some substantive effects that provide likelihoods for conflict under certain conditions:

Table 7.5
Probability of Conflict Onset, 1970-2000
Estimates Obtained from Table 7.4

Variable	Treatment	Pr(Conflict Onset)	% Increase
Baseline: Arms Race Contiguity ln(Capability Ratio)	0 0 $\bar{x}$	0.07% (0.0007)	–
Ground Race*	1	0.08% (0.001)	14%
Sea Race*	1	0.25% (0.004)	257%
Air Race	1	0.1% (0.002)	43%

Variable	Treatment	Pr(Conflict Onset)	% Increase
Baseline: Arms Race Contiguity ln(Capability Ratio)	0 1 $\bar{x}$	2.3% (0.01)	–
Ground Race*	1	3.1% (0.019)	35%
Sea Race*	1	7.2% (0.059)	213%
Air Race	1	4.2% (0.024)	83%

*estimated coefficients not significant

The first section of Table 7.5 shows the likelihood of interstate conflict with no arms racing and no contiguity present to be only seven-tenths of 1%. Militarized interstate disputes are rare events and as I have discussed earlier this is especially true for Latin America. Here the presence of an aerial arms race increases the overall likelihood of militarized conflict to a still extremely unlikely one-tenth of 1%, or an increase of 43% over the baseline probability. Realistically, however, the substantive effects I describe from the first portion of Table 7.5 suggest the base probability of a

MID to be so low (under these conditions) that the presence of an aerial arms race produces no meaningful impact.

The numbers become more palatable when contiguity is present as the baseline expected value of a militarized dispute becomes approximately 2.3%. The presence of an aerial arms races generates a likelihood for conflict of 4.2% representing an 83% increase in the baseline probability of an MID. Lastly, although I report the effects of both ground and naval arms races neither figures should be interpreted with much confidence since both coefficients fail to reach any level of statistical significance in my empirical models of conflict.

7.5 Summary and Conclusions

This has been the final empirical evaluation of my theory of arms racing and international conflict. Consistent with the two previous empirical chapters I again find strong support for the notion that contentious issues increase the likelihood that two states will engage in extraordinary bilateral arming. Issues increase the likelihood of bilateral arming across all three forms of weaponry in Latin America during the period 1970-2000. Most importantly, this finding serves to illustrate the fundamental importance of issues as a driving force in international politics and as a starting point for understanding the arming behavior of states.

To begin, the results for Hypothesis 1 – the impact of arms racing on the onset of militarized conflict – are quite different. The generally positive and statistically significant relationship between various forms of arms racing and militarized conflict

drops off dramatically in Latin America. Here, both ground based and naval arms racing fail to reach any conventional level of statistical association with the likelihood of conflict onset. Only aerial based arms racing seems to increase the chances for interstate conflict (at $p \leq .10$). As discussed earlier with Africa, one possible explanation for this result might involve the overall size of the Latin American region; given its general expanse it becomes easier to understand why states in Latin America would choose to pursue their conflicts through the air. Nonetheless, the lack of strong support for Hypothesis 1 is commensurate with Latin America's historically low levels of interstate conflict.

Perhaps most surprising is the capability ratio control variable 'turns on' in Latin America. In all three regions the contiguity control has been positively associated with conflict at $p \leq .01$ but only in Latin America does capability ratio suddenly reveal a positive and significant effect on the outcome variable and at the reasonably strong level of $p \leq .05$. This suggests Latin American states may be basing much of their decision to engage in conflict with one another using strict determinations of relative power (of which arms are certainly one component); that is, similarly powerful states (parity) are much more likely to engage in militarized conflict than are disparately powerful states (one state preponderant) in Latin America.

As I proposed earlier, the strength of both control variables (contiguity and power parity) may be limiting the explanatory power of the arms race variables themselves. Even so, however, that a statistically significant relationship between the presence of aerial arms racing and conflict onset holds is perhaps telling of the overall

importance (and danger) of aerial weaponry in Latin America during my period of study. I discuss this along with other broader considerations and conclusions in the final chapter of this dissertation that follows.

Appendix 7A
List of Countries

Latin America, 1970-2000
Argentina
Belize
Bolivia
Brazil
Chile
Colombia
Costa Rica
Ecuador
Guatemala
Guyana
Honduras
Mexico
Nicaragua
Panama
Paraguay
Peru
El Salvador
Suriname
Venezuela

Appendix 7B
List of Arms Races, 1970-2000

Dyad	Ground	Sea	Air	All
Mexico – El Salvador	1986-1990		1973-1979 1984-1991	
Mexico – Nicaragua	1978-1982		1983-1989	
Mexico – Paraguay	1980-1984			
Mexico – Chile	1987-1991	1973-1980		
Mexico – Guatemala			1981-1986	
Mexico – Honduras			1974-1979	
Guatemala – El Salvador	1975-1979			
Guatemala – Venezuela	1974-1979			
Guatemala – Ecuador	1973-1981		1979-1985	
Guatemala – Peru	1973-1978		1981-1985	
Guatemala – Brazil	1973-1979		1980-1984	
Guatemala – Bolivia	1977-1981			
Guatemala – Chile	1973-1981			
Guatemala – Argentina	1973-1977			
Honduras – Guyana	1982-1986			
Honduras – Suriname	1985-1989			
Honduras – Bolivia	1980-1986			
El Salvador – Nicaragua	1978-1987		1978-1988	
El Salvador – Colombia	1982-1987		1984-1991	
El Salvador – Venezuela	1975-1979 1983-1987		1984-1990	

Dyad	Ground	Sea	Air	All
El Salvador – Guyana	1982-1986			
El Salvador – Suriname	1985-1989			
El Salvador – Ecuador	1975-1979		1973-1979	
El Salvador – Brazil	1975-1979		1986-1991	
El Salvador – Bolivia	1982-1986		1973-1977 1984-1991	
El Salvador – Paraguay	1975-1979		1973-1979	
El Salvador – Uruguay	1983-1987		1973-1979	
Nicaragua – Colombia	1982-1987		1979-1989	
Nicaragua – Venezuela	1981-1987		1984-1989	
Nicaragua – Ecuador	1978-1983		1979-1987	
Nicaragua – Bolivia	1978-1986		1983-1989	
Nicaragua – Paraguay	1978-1988		1978-1983 1985-1989	
Nicaragua – Chile	1978-1987		1983-1987	
Nicaragua – Argentina	1978-1982		1983-1987	
Nicaragua – Uruguay	1980-1988		1981-1985	
Venezuela – Paraguay	1975-1979			
Venezuela – Chile	1975-1979	1973-1980 1986-1991	1989-1993	
Guyana – Paraguay	1981-1986			
Guyana – Chile	1981-1985			
Ecuador – Peru	1973-1978	1971-1975	1973-1979	1973-1975
Ecuador – Brazil	1973-1977			
Ecuador – Paraguay	1975-1980		1973-1981	

Dyad	Ground	Sea	Air	All
Ecuador – Chile	1973-1980		1973-1980 1989-1993	
Peru – Brazil	1971-1978			
Peru – Chile	1973-1977	1976-1980	1973-1979	1976-1977
Peru – Argentina	1971-1975			
Brazil – Paraguay	1975-1979			
Brazil – Chile	1973-1977		1989-1993	
Brazil – Argentina	1971-1977			
Chile – Argentina	1972-1977	1974-1980	1972-1980	1974-1977
Mexico – Bolivia			1973-1977	
Mexico – Paraguay			1973-1980	
Mexico – Chile			1973-1980	
Mexico – Uruguay		1990-1995	1973-1980	
Belize – Colombia			1990-1994	
Belize – Uruguay			1991-1995	
Guatemala – Nicaragua			1979-1985	
Honduras – Ecuador			1974-1981	
Honduras – Peru			1974-1979	
Honduras – Brazil			1985-1993	
Honduras – Bolivia			1985-1991	
Honduras – Argentina			1974-1981	
Honduras – Uruguay			1974-1981 1989-1993	
El Salvador – Peru			1973-1979	
El Salvador – Argentina			1973-1979	
Nicaragua – Brazil			1978-1989	
Colombia – Chile		1973-1980	1989-1993	
Colombia – Uruguay		1988-1995	1989-1993	
Venezuela – Uruguay		1987-1995	1989-1993	
Suriname – Paraguay			1996-2000	
Ecuador – Bolivia			1973-1977	

Dyad	Ground	Sea	Air	All
Ecuador – Uruguay			1972-1980 1989-1993	
Peru – Bolivia			1973-1977	
Peru – Paraguay			1973-1979	
Peru – Uruguay			1973-1979	
Brazil – Uruguay		1990-1994	1989-1993	
Bolivia – Paraguay			1973-1977	
Bolivia – Chile			1973-1977	
Bolivia – Argentina			1973-1977	
Bolivia – Uruguay			1973-1977	
Paraguay – Chile			1973-1977	
Paraguay – Argentina			1973-1981	
Chile – Uruguay		1985-1991	1973-1977 1989-1993	
Argentina – Uruguay			1973-1981	
Venezuela – Peru		1971-1975		

Chapter 8

Considerations and Conclusions

8.1 Introduction

In this dissertation I addressed what has continued to be an elusive question: what is the relationship between arms races and the likelihood of conflict amongst states engaged in them? My investigation into the relationship between arms racing and militarized conflict involved important decisions made at the theoretical, research design, and methodological portions of this dissertation. Before reviewing the major findings of my research I believe it beneficial to revisit some of the more critical decisions and strategies that constituted the overall framework I used to evaluate the impact of arms races on conflict. The concise yet critically relevant piece by Diehl and Crescenzi (1998) introduced in chapter two helps guide the following section.

8.2 Reconfiguring the Arms Race-War Debate

Summarized earlier in my literature review, Diehl and Crescenzi's 1998 article "Reconfiguring the Arms Race-War Debate" offered a clear path forward for researchers interested in furthering the quantitative arms racing and conflict research agenda. To

be clear, in the very nascent stages of this dissertation I established some specific goals and intended contributions I wanted to achieve in my research endeavor. Having concluded my analysis I find that much of my own research deals with the key concerns and suggestions posited by Diehl and Crescenzi more than a decade ago. In their article the authors highlight several specific ways through which arms race studies can be improved. I list below these unique recommendations and follow with an explanation of how my research in this dissertation has addressed each of their concerns.

'Longitudinal Studies'

> "One of the key problems with the original Wallace (1979) research design, and one duplicated by all his critics, has been to focus just on dispute escalation and therefore select only cases in which a dispute has already occurred...The prior presence of conflict in all the cases examined creates a risk of introducing a kind of selection bias...We are unable to assess the role arms races may play in the onset, termination, and reoccurrence of violent conflict. In order to address these concerns, we advocate the adoption of more longitudinal studies of arms races...One way would be to select arms races as the unit of analysis and trace whether conflicts arise, reoccur, escalate, and terminate over time and under what conditions" (Diehl and Crescenzi, 1998: 115).

To be fair, this concern does not suggest earlier works to be without substantive importance. Studies such as Wallace (1979) and other similarly designed investigations (flawed as they may be) tell us something about the nature of conflict escalation when arms races are present, for example. The 'problem', however, is this type of study does not get at the heart of what has persistently troubled many conflict scholars at least since the writings of Richardson (1960): are two states involved in an arms race more or less likely to *begin* a militarized conflict with each other. While understanding how arms

races may escalate (or terminate) ongoing conflict is an interesting theoretical question in its own right one of the most important tasks for conflict scholars is identifying factors that increase or decrease the likelihood of conflict in the first place.

Thus, my goal in this dissertation was to provide evidence in support of the steps-to-war theory showing how the presence of an arms race increases the likelihood for the onset of militarized conflict. As a result, my analysis focused on the arms race itself and whether an arms race increased the chances for militarized conflict amongst states not already involved in ongoing disputes with one another. Again (and most importantly), the issue based approach utilized in this dissertation provided the theoretical guidance necessary to correctly observe states involved in an arms race against one another (those with disparate UN voting patterns); that is, arms races only occur between states with contentious issues. Since my measure of contentious issues – ideal points generated from United Nations General Assembly voting records – is not itself defined in terms of conflict or disputes I can make a clean assessment about the relationship between arms racing and conflict onset.

For example, using rivalry to identify arms races would bias any potential inferences about the effect of arms races on conflict. This is because many operational definitions of rivalry are themselves based on militarized disputes.[65] Thus, defining an arms race in terms of militarized disputes in order to predict future militarized disputes does not provide much insight into the problem at hand. Gibler et al. (2005) voice this

[65] As I have mentioned, Thompson's (2001) list of strategic rivals is created using qualitative historical accounts of the hostility and negative perceptions states have had of one another. Although using this dataset bypasses the problem of rivals that are defined by the density of their militarized conflicts with one another it still presupposes that arms races can and do occur only between rivals. This is an assumption I do not make in this dissertation.

concern noting that "As Diehl and Crescenzi (1998) point out, the most obvious place to look for competition is in the rivalry literature. Unfortunately for our purposes, most definitions of rivalry are based upon dispute density" (136). In adopting an issues based approach to my study of arms racing my analysis appears to satisfy Diehl and Crescenzi's interest in conflict onset but without the problems associated with defining an arms race in terms of conflict.

'A Broader Spatial Domain'

> "A second research design limitation is that the arms race-war debate focused exclusively on major power conflict. There is no reason why the logic should not apply equally well to minor power conflict...Looking at minor power conflict greatly expands the number of cases, and thereby considerably lessens the likelihood that the results will be contaminated by contagion or controversial war dyad cases from the two world wars" (Diehl and Crescenzi, 1998: 115).

As I explained in the very beginning of this dissertation, my focus on minor power arms racing and conflict is above all motivated by the normative concerns expressed by Lemke (2002), amongst others. His fundamental point is that minor power states and their citizens comprise an overwhelming majority of the world's population, are indispensable actors in world politics, and ultimately deserve the same type of meticulous and probing research into the sources of conflict such that minor power conflict might be understood better and perhaps prevented. So while Lemke extended traditional power transition theory to minor powers I have similarly attempted to broaden the scope of arms race and conflict studies to include a large proportion of the

system's minor powers (though my own efforts in no way represent the first attempt to do so).

Beyond the inherent importance of minor power states as political actors and homelands for millions studying these states also benefits the research agenda itself as alluded to above by Diehl and Crescenzi (1998). Lemke (2002) echoes the point made by Diehl and Crescenzi above in noting "...there may be something odd about great powers compared to the rest of the world's states which we thereby exclude ourselves from knowing if we only study the great powers" (6) and thus "...any scholar interested in understanding the causes of war should be interested in explanations of war that account for a larger proportion of the world's actors" (14). Hence, I investigated three minor power regions in this dissertation. Though not an exhaustive investigation, I believe the regions of Latin America, Africa, and the Middle East provided an appropriate and large enough set of cases over which to test the steps-to-war theory of arms racing and international conflict. As a result, the empirical results stand as a useful contribution to the growing body of research on minor power interactions and, specifically, factors that may promote conflict between them.

'Breaking the Reliance on Military Expenditure Data'

> "Traditionally, arms races have been measured by reference to abnormal increases in military expenditures...It is often difficult to get the necessary data on military expenditures, and the validity of precise estimates is further open to question when those data must be converted to a common currency...An analysis of arms races might be better conducted with an analysis of *weapons stockpiles* [emphasis added]...Because states are threatened by actual arms rather than arms budgets, this would allow greater validity in measurement and allow the analyst to detect weapons-specific arms races masked in the aggregate military expenditure totals" (Diehl and Crescenzi, 1998: 116).

This excerpt highlights one of the central decisions made before starting this dissertation. An important concern of mine was that arms races should be measured with arms stockpiles. Early on I noted that while previous studies using expenditure data were important contributions the use of actual weapons stockpiles would be a more faithful representation of the concept of an arms race and, most importantly, would "...allow greater validity in measurement..." as Diehl and Crescenzi note in the above quote. Although some earlier studies attempted this in a limited fashion – such as both McCubbins' (1983) and Ward's (1984) studies of American and Soviet strategic weapons stockpiles – one primary goal in this dissertation was to expand the use of weapons stockpile data over a larger temporal and spatial domain.

Just as compelling, the use of weapons stockpile data facilitated an analysis of specific types of arms races: ground, sea, and aerial arms races. This, I believe, offers some progress forward towards a more nuanced understanding of the impact of various types of weapons on conflict that at best cannot be easily observed when working with very general aggregate expenditure data or, at worst, becomes completely obfuscated amongst a defense expenditure figure that is the sum of all military expenditures over

all weapons types (as Diehl and Crescenzi warn). Thus, even though the theory advanced earlier is about the positive relationship between arms races and militarized conflict the categorization of arms races into three separate types allowed for the potential to observe interesting variation in the impact of arms races by type and across regions: in other words, are certain arms races more conflict prone than others in each of the three regions? As my review of the findings later will show, this was indeed the case.

'Multivariate Models'

> "Too many previous studies have only looked at bivariate associations between the key variables. Arms race studies must now catch-up with the rest of the international conflict field and recognize that no single variable (arms races or otherwise) is likely to explain all wars...including other variables as controls may be necessary in order to assess whether the alleged positive relationship between arms races and war remains or disappears...including other factors in the model permits an assessment of the relative strength of the arms race variable in predicting war, thereby allowing us to understand the 'substantive' as well as the 'statistical' significance of the impact of arms races on wars" (Diehl and Crescenzi, 1998: 116).

Clearly, the use of more advanced statistical models continues to be an important part of international relations research. Sample's (1998, 2002) research, for example, heeds the authors' advice above as her arms race studies are evaluated using a host of control variables. However, international relations scholars are now beginning to understand that while simple bivariate models may often be inadequate large 'garbage can' statistical models where all ostensibly important controls are dumped are likely to produce coefficient estimates just as positively or negatively skewed for the

researcher. A reluctance to control for every single potential variable is an important debate that has emerged since the publication of Diehl and Crescenzi's suggestion above and is a topic I addressed in more detail in the research design of chapter four.

Weighing the call for multivariate analyses in conjunction with the potential problems of overspecified models I argue my statistical evaluations achieve a reasonable balance between both camps. Rather than include any and all covariates with a previously demonstrated impact on interstate conflict I identified the two control variables – capability ratio and direct contiguity – I believed would provide the most robust test of my primary explanatory variable, the arms race. As specifically explained in chapter four, both control variables are not just associated with conflict but – more importantly – both variables are potentially correlated with arms racing itself. As a result, I choose to include these two controls in place of many others and believe the empirical findings reflect accurately the substantive and statistical impact – a concern raised by Diehl and Crescenzi – of arms races on interstate conflict.

I have now outlined and discussed Diehl and Crescenzi's (1998) essential suggestions for future research. According to these authors, they represent some of the most important ways forward for the arms race and conflict research program. Of course, the list is not meant to be exhaustive; there are no doubt other relevant issues not mentioned by Diehl and Crescenzi or touched upon in this dissertation. Regardless, I have presented their proposals here as a means by which to demonstrate how my own analysis has dealt with their concerns and ideas. Lastly, their specific points have helped me to organize a succinct recapitulation of some of the major theoretical and research

design decisions and strategies I employed in this dissertation. Moving along, the following section is a concise review of the actual empirical results of obtained from my investigation.

8.3 What Has Been Learned?

While a significant amount of international relations scholarship has dealt with the causes and consequences of arms races the research program as a whole has remained without any clear answers. As I referenced in the opening chapter, Gibler et al. (2005) noted "...little conclusive social science evidence exists as to whether arms races deter, escalate, or are spurious to conflict" (1). This dissertation has therefore been a concentrated effort to provide large-N empirical evidence in support of the theoretical proposition that arms races increase the likelihood of conflict *onset* between states. The statistical evidence was gleaned from an investigation of arms racing and conflict over three separate regions: the Middle East, Africa, and Latin America. The following sections revisit some of the major findings of this research.

The critical question addressed in this dissertation, of course, was the relationship between arms races and the onset of militarized conflict. Overall, I find support for the claim that states involved in an arms race are more likely to experience conflict than otherwise would be expected. In the Middle East both ground based and naval arms races are positively associated with the onset of militarized conflict with further analysis showing ground based arms races to be the most conflict prone. In Africa, naval and aerial arms races significantly increase the probability two states will

start a conflict with one another and in this region it appears that naval arms races produce the highest likelihood of interstate conflict.

The impact of arms racing on conflict is weaker in Latin America, the third region analyzed in this dissertation. Here, only aerial based arms races are associated with interstate conflict at a statistically significant level. Discussed in chapter seven, there are at least a couple of reasons for the weaker findings observed in Latin America. One explanation for this finding involves the role of the two key control variables of contiguity and the power capability ratio between states. Although the contiguity covariate is significant in all three regions capability ratio is positive and statistically significant for the first time in Latin America and for all three arms race models in this region. In conjunction with this fact is the recognition by many researchers and analysts that Latin America has been a region particularly absent of interstate conflict. The result, then, is that both the contiguity and capability ratio variables may be accounting for most of the variation in the dependent variable conflict which itself turns out to be a particularly rare event in Latin America.

Thus, the predictive power of the arms race variables suffers and even though states in Latin America appear to engage in arms races with one another the overall prevalence of interstate conflict is low enough such that a strong statistical association is difficult to define. Interestingly enough, this dynamic serves to highlight even more the importance of the finding that aerial arms racing is the only type of arms race likely to produce interstate conflict in Latin America. Examples from chapter seven explained how aerial weaponry has played an important role in some of the more prominent

conflicts in Latin America; news stories from more recent years also indicate how many states in this region are pursuing defense contracts or using domestic production (in the case of Brazil's Embraer corporation) in order to achieve aerial superiority. The role of aerial arms races in previous conflicts along with the attempts of many Latin American states to acquire advanced aerial combat weaponry is consistent with the finding that only aerial arms races appear to increase the chances for conflict within this region.

8.4 Limitations and Extensions

An important part of any large research endeavor is to recognize and discuss some of the limitations encountered as well as possible research extensions. I begin by noting some limitations of this dissertation. As with most quantitative analyses, data is paramount. I strongly believe both the temporal and spatial domain used here provide a good test of the theory and, ultimately, defensible results. However, there were several data limitations. First, the United Nations voting data is current only to the year 2000. This means I was unable to include nearly ten additional years worth of analysis due to the lack of data representing the 'issues' component of my theory. Data limitation is at work with the weapons stockpile data, as well. Although the United Nations data extends back to 1946 the reliability of weapons stockpile information for many of the minor power states breaks down rapidly before 1970; in addition, information for many of the system's minor powers is not even available before 1970. As a result, it becomes extremely difficult to extend the analysis back in time therefore suggesting updates to the analysis of arms racing and conflict will likely be forward

looking as United Nations voting records and weapons stockpile data continue to be available and more reliable.

Beyond these noted limitations there are several obvious extensions, as well. First, there are some states not covered in my investigation of minor power arms racing here. These states are located primarily in central Asia (such as the former Soviet republics as well as the Indian subcontinent), Southeast Asia, and the Pacific Rim. Though not included in my analysis this time, they are no less important as ongoing contentious issues fuel dangerous arming between India and Pakistan along with the evolving crisis on the Korean peninsula, for example. Indeed, there remain ample opportunities for research on arms races and conflict processes. My analyses have dealt strictly with the propensity for arms races to produce interstate conflict. Yet, an important strain of international relations research now focuses on how conflict develops once started and how it ends.

Scholars have investigated the impact of rivalry and regime type, for instance, on the duration of conflict as well as what factors promote durable peace agreements after conflict termination. Future arms race research would benefit from some of these same questions: are certain types of arms races likely to produce longer, more destructive conflicts? What types of arms races are likely to escalate ongoing disputes? How can negotiated settlements be reached after a costly and potentially deadly arms race? However, there are other important topics for future research such as extensions related to both the origins and outcomes of arms races that do not exclusively involve understanding international conflict. Below I list a few avenues for future research that

would greatly expand our collective knowledge about arms races beyond their role in provoking militarized disputes.

First: on the origins of arms races, how are states acquiring their weapons? Clearly, the major powers of the international system are able to develop and manufacture the weapons comprising their large and technologically advanced militaries. This is most likely not the case with the minor power states analyzed in this dissertation. While perhaps only a handful of minor power states have the infrastructure to support some semblance of a defense industry (such as Brazil's Embraer company), the overwhelming majority of these states rely on negotiations and arms transfers from some of the major arms producing states of the world. In June of 2009:

> "Saudi Arabia's Assistant Defence and Aviation Minister Prince Khaled bin Sultan received the Kingdom's first two Eurofighter Typhoon fighter aircraft at a ceremony hosted by BAE [British Aerospace] at its Warton plant near Preston on June 10. The Typhoon is among the most advanced and sophisticated jet fighter bombers in operation and Saudi Arabia will be the first country outside of Europe to take delivery of the aircraft" (Bailey, 2009).

For the purposes of this dissertation the means and methods by which states may have acquired their weapons was unimportant; the central question was about the impact of arms races on conflict and not the origins of these weapons. However, a future project might investigate in more detail the arms transfer dynamic. What kinds of states are providing arms for these minor powers? Introducing the arms producing state complicates the theory in some interesting ways: what are the incentives of the donor state? Are donor states economically motivated or do they provide weapons to

client states in order that they may deal with threats and enemies of the donor state? On the other end, what – besides security concerns – motivates political leaders to seek large increases in weapons? A host of domestic political theories could suggest wide ranging incentives from the desire to maintain public support to the need to deter or suppress domestic political strife and opposition groups to list just a few examples. These questions alone can fuel a host of new studies and broaden our understanding about how and why states arm and the consequences of arms races.

8.5 Final Thoughts

Under different circumstances this could have been a dissertation about the perpetual need for man to arm himself. The small sampling of anthropological research cited in the opening pages of this dissertation only hint at the role weapons have played since humanity's earliest beginnings. That weapons have been an inherent desire for man throughout time is critical motivation for this research since states are simply the amalgamation of men and women. One hundred thousand years later the leaders of states harbor the same need for power and security that weapons provided to their ancestors. Unfortunately, the complexity of the international system along with the multitude of potentially incendiary issues between states means those involved in arms competitions with one another are in general more likely to experience conflict than peace.

So what might be proscribed? Without a doubt, weapons and militaries will continue to be key features of states and the international system. Although

international relations scholars have grappled with determining the effect of arms races on militarized conflict the results offered in this dissertation support what many political leaders and statesman have long suspected, especially now more than ever: arms races are dangerous events between states that increase the probability for militarized confrontations and conflicts. While some types of arms races may be more conflict prone than others the policy proscription is simple: arms races must be dealt with as quickly as they arise. Given that issues appear to drive these competitions, leaders and peacekeepers alike would benefit from identifying the contentious issues at stake before an arms race can develop. Ongoing arms races should be addressed with even greater urgency either through third party interventions or intergovernmental organizations that can exercise political legitimacy and peacekeeping.

References Cited

Achen, Christopher H. 2002. "Toward a New Political Methodology: Microfoundations and ART." *Annual Review of Political Science* 5: 423-450.

Al Arabiya. 2009. *Arming for Security Against Iran: Gulf In An Arms Race Despite Global Downturn.* March 14, 2009, from http://www.alarabiya.net/articles/2009/02/23/67077.html#002

Al-Jazeera. 2008. *North African Arms Race.* July 20, 2009, from http://english.aljazeera.net/programmes/insidestory/2008/04/20086150573511579.html

Anderton, Charles H. 1989. "Arms Race Modeling: Problems and Prospects." *Journal of Conflict Resolution* 2:346-67.

Associated Press. 1987. *Senate Panel Rejects Proposed Sale of Jets to Honduran Forces.* July 22, 2009, from http://www.nytimes.com/1987/06/03/world/senate-panel-rejects-proposed-sale-of-jets-to-honduran-forces.html?scp=6&sq=honduras%20jets&st=cse

Bailey, Robert. 2009. *Saudi Defence Industry Strategy Takes Shape*. June 26, 2009, from http://www.english.globalarabnetwork.com/200906141200/Saudi-Politics/saudi-defence-industry-strategy-takes-shape.html

Beck, Nathaniel, Jonathan N. Katz and Richard Tucker. 1998. "Taking Time Seriously: Time-Series-Cross-Section Analysis with a Binary Dependent Variable." *American Journal of Political Science* 42: 1260–88.

Bennett, D. Scott. 1996. "Security, Bargaining, and the End of Interstate Rivalry." *International Studies Quarterly* 40: 157-184

Bennett, D. Scott and Alan C. Stam. 2000. "*EUGene*: A Conceptual Manual" *International Interactions* 26: 179-204.

Boehmer, Charles, Eric Gartzke, and Timothy Nordstrom. 2004. "Do Intergovernmental Organizations Promote Peace?" *World Politics* 57: 1-38.

Bolks, Sean and Richard J. Stoll. 2000. "The Arms Acquisition Process: The Effect of Internal and External Constraints on Arms Race Dynamics. *Journal of Conflict Resolution* 44: 580-603.

Bremer, Stuart A. 1992. "Dangerous Dyads: Conditions Affecting the Likelihood of Interstate War, 1816-1965." *Journal of Conflict Resolution* 36:309-41.

The British Broadcasting Corporation. 1979. *Iran: In Brief; Dismissal of Ambassadors.* July 16, 2009, from https://www-lexisnexis-com.ezproxy.rice.edu/us/lnacademic/results/docview/docview.do?docLinkInd=true&risb=21_T6969254592&format=GNBFI&sort=RELEVANCE&startDocNo=1&resultsUrlKey=29_T6969254595&cisb=22_T6969254594&treeMax=true&treeWidth=0&csi=10962&docNo=3

The British Broadcasting Corporation. 2000. *Flashback: Invasion of Kuwait.* July 15, 2009, from http://news.bbc.co.uk/2/hi/world/middle_east/856009.stm

The British Broadcasting Corporation. 2009. *Country Profile: Democratic Republic of Congo.* May 5, 2009, from http://news.bbc.co.uk/2/hi/africa/country_profiles/1076399.stm

Carter, David and Curtis S. Signorino. 2007. "Back to the Future: Modeling Time Dependence in Binary Data." Paper prepared for the annual Political Methodology Summer Conference, University Park, PA.

Central Intelligence Agency. 2008. *The CIA World Factbook.* July 2, 2008, from https://www.cia.gov/library/publications/the-world-factbook/index.html

Churchill, Steven E. Jill Rhodes. 2007. The Evolution of the Human Capacity for Killing at a Distance: The Human Fossil Evidence for the Evolution of Projectile Weaponry. In *The Evolution of Hominid Diets: Integrating Approaches to the Study of Palaeolithic Subsistence*, eds. Michael Richards and Jean-Jacques Hublin. Heidelberg, Germany: Springer-Verlag (in press).

Clarke, Kevin A. 2005. "The Phantom Menace: Omitted Variable Bias in Econometric Research." *Conflict Management and Peace Science* 22: 341-352.

Clarke, Kevin A. 2009. "Return of the Phantom Menace: Omitted Variable Bias in Political Research." *Conflict Management and Peace Science* 26: 46-66.

Crystal, Jill. 1995. *Oil and Politics in the Gulf: Rulers and Merchants in Kuwait and Qatar.* Cambridge: Cambridge University Press.

Cusack, Thomas R. and Richard J. Stoll. 1990. *Exploring Realpolitik: Probing International Relations Theory With Computer Simulation.* Boulder: Lynne Rienner.

Dart, Raymond A. 1959. "Further Light on Australopithecine Humeral and Femoral Weapons." *American Journal of Physical Anthropology* 17: 87-93

Diehl, Paul F. 1983. "Arms Races and Escalation - a Closer Look." *Journal of Peace Research* 20:205-12.

Diehl, Paul F. 1985. "Arms Races to War: Testing Some Empirical Linkages." *Sociological Quarterly* 26:331-49.

Diehl, Paul F and Mark J. C. Crescenzi. 1998. "Reconfiguring the Arms Race War Debate." *Journal of Peace Research* 35:111-8.

Diehl, Paul F. and Gary Goertz. 2000. *War and Peace in International Rivalry.* Ann Arbor: University of Michigan Press.

Farmer, Malcolm F. 1994. "The Origins of Weapons Systems." *Current Anthropology* 35: 679-681.

Fearon, James D. 1995. "Rationalist Explanations for War." *International Organization* 49: 379-414.

Forecast International. 2008. *Latin America: Military Modernization or Arms Race?* July 22, 2009, from http://www.forecastinternational.com/notable/flightglobal.pdf

Gartzke, Erik. 1998. "Kant We All Just Get Along? Motive, Opportunity, and the Origins of the Democratic Peace." *American Journal of Political Science* 42: 1–27.

Geller, Daniel S. 2000. Material Capabilities: Power and International Conflict. In *What Do We Know About War,* ed. John A. Vasquez. Lanham, Maryland: Rowman and Littlefield.

Gelpi, Christopher, and Peter. D. Feaver. 2002. "Speak Softly and Carry a Big Stick? Veterans in the Political Elite and the American Use of Force." *American Political Science Review* 96: 779-793.

Gibler, Douglas M. 1997. "Control the Issues, Control the Conflict: The Effects of Alliances that Settle Territorial Issues on Interstate Rivalries." *International Interactions* 22: 341-368.

Gibler, Douglas, Toby Rider, and Marc Hutchison. 2005. "Taking Arms Against a Sea of Troubles: Interdependent Racing and the Likelihood of Conflict in Rival States" *Journal of Peach Research* 42:131-47.

Giniger, Henry, Milt Freudenheim, and Carlyle C. Douglas. 1984. *The World; South Africa Attacks Angola.* July 17, 2009, from http://www.nytimes.com/1984/01/01/weekinreview/the-world-south-africa-attacks-angola.html

Gleditsch, Nils Petter and J. David Singer. 1975. "Distance and International War, 1816-1965." In *Proceedings of the IPRA Conference, IPRA Studies in Peace Research.* Oslo: International Peace Research Association: 481–506.

Gleditsch, Nils Petter and Olav Njolstad, eds., with Dieter Senghaas and Raimo Vayrynen. 1990. *Arms Races – Technological and Political Dynamics.* London: SAGE.

Gochman, Charles S. 1990. "The Geography of Conflict: Militarized Interstate Disputes Since 1816." Paper Prepared for the Annual Meeting of the International Studies Association, Washington, DC.

Gray, Colin S. 1971. "'The Arms Race Phenomenon." *World Politics* 24: 1.

Harden, Sheila. 1985. *Small is Dangerous.* London: Frances Pinter.

Hensel, Paul R. 1996. "Charting a Course to Conflict: Territorial Issues and Interstate Conflict, 1816-1992." *Conflict Management and Peace Science* 15: 43-73.

Hensel, Paul. 2000. "Territory: Theory and Evidence on Geography and Conflict." In John A. Vasquez, ed., *What Do We Know About War?.* Lanham, MD: Rowman and Littlefied: 57-84.

Hensel, Paul R., Sara McLaughlin Mitchell, Thomas E. Sowers II, and Clayton L. Thyne. 2008. "Bones of Contention: Comparing Territorial, Maritime, and River Issues." *Journal of Conflict Resolution* 52: 117-143.

Herz, John H. 1950. "Idealist Internationalism and the Security Dilemma." *World Politics* 2: 157-180.

Hirsh, Michael. 2008. *The Guns of November: Will Iran's Missile Test Force the Region To War?* July 21, 2008, from http://www.newsweek.com/id/145244

Horn, Michael D. 1987. "Arms Races and the International System." In *Department of Political Science, University of Rochester.* Rochester, NY: University of Rochester.

Huntington, Samuel P. 1958. Arms Races: Prerequisites and Results. In *Public Policy,* eds. Carl J. Friedrich and Seymour E. Harris. Cambridge, Mass.: Harvard University Press.

The International Institute for Strategic Studies. 1970-2000. *The Military Balance.* London: Oxford University Press.

Isard, Walter Charles H. Anderton. 1985. "Arms Race Models: A Survey and Synthesis." *Conflict Management and Peace Science* 8: 27-98.

Janardhan, Meena. 2007. *U.S. Could Trigger Deadly Middle East Arms Race.* July 2, 2008, from http://www.alternet.org/story/59218/

Jane's Information Group. 2009. *Sentinel Security Assessment – North Africa.* July 17, 2009, from http://www.janes.com/articles/Janes-Sentinel-Security-Assessment-North-Africa/Air-force-Eritrea.html

Jervis, Robert. 1976. *Perceptions and Misperceptions in International Politics*. Princeton: Princeton University Press.

Jervis, Robert. 1978. "Cooperation Under the Security Dilemma." *World Politics* 30: 167-214.

Jones, Daniel M., Stuart A. Bremer, and J. David Singer. 1996. "Militarized Interstate Disputes, 1816-1992: Rationale, Coding Rules, and Empirical Patterns." *Conflict Management and Peace Science* 15: 163-215.

Keohane, Robert. 1984. *After Hegemony: Cooperation and Discord in the World Political Economy.* Princeton: Princeton University Press.

Kim, Soo Yeon and Bruce Russett. 1996. "The New Politics of Voting Alignments in the United Nations General Assembly." *International Organization* 50: 629-652.

King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the Most of Statistical Analyses: Improving Interpretation and Presentation." *American Journal of Political Science* 44: 347-361.

Kydd, Andrew. 1997. "Game Theory and the Spiral Model." *World Politics* 49: 371-400

Kydd, Andrew. 2000. "Arms Races and Arms Control: Modeling the Hawk Perspective." *American Journal of Political Science* 44: 228-44.

Kydd, Andrew. 2005. *Trust and Mistrust in International Relations.* Princeton: Princeton University Press.

Lakatos, Imre. 1970. "Falsification and the Methodology of Scientific Research Programmes." In I. Lakatos and A. Musgrave, eds., *Criticism and the Growth of Knowledge.* Cambridge: Cambridge University Press.

Lambelet, Jean-Christian. 1971. "A Dynamic Model of the Arms Race in the Middle East, 1953-1965." *General Systems* 16: 145-167.

Lambelet, John C. 1973. "Towards a Dynamic Two-Theatre Model of the East-West Arms Race." *Journal of Peace Science* 1:1-38.

Lambelet, Jean-Christian. 1975. "Do Arms Races Lead to War?" *Journal of Peace Research* 12: 123-128.

Lambelet, Jean-Christian, Urs Luterbacher, and Pierre Allan. 1979. "Dynamics of Arms Races: Mutual Stimulation vs. Self-Stimulation." *Journal of Peace Science* 4: 49-67.

Lambelet, Jean-Christian. 1986. "The Formal ('Economic') Analysis of Arms Races: What – If Anything – Have We Learned Since Richardson?" *Conflict Management and Peace Science* 9: 1-17.

Lambelet, Jean-Christian and Urs Luterbacher. 1987. Conflicts, Arms Races, and War: A Synthetic Approach. In *Peace, Defence, and Economic Analysis,* eds. Christian Schmidt and Frank Blackaby. London: Macmillan Press.

Lemke, Douglas. 1995. "The Tyranny of Distance: Redefining Relevant Dyads." *International Interactions* 21:23-38.

Lemke, Douglas. 2002. *Regions of War and Peace.* Cambridge: Cambridge University Press.

Leng, Russell J. 1980. "Influence Strategies and Interstate Conflict." In J.David Singer, ed., *The Correlates of War,* vol. II. New York: Free Press: 124-157.

Majeski, Stephen J. and David L. Jones. 1981. "Arms Race Modeling: Causality Analysis and Model Specification." *Journal of Conflict Resolution* 25: 259-288.

Mansbach, Richard W. and John A. Vasquez. 1981. *In Search of Theory: A New Paradigm for Global Politics*. New York: Columbia University Press.

Maoz, Zeev. 1983. "Resolve, Capabilities, and the Outcomes of Interstate Disputes, 1816-1976." *Journal of Conflict Resolution* 27: 195-229.

McCubbins, Mathew D. 1983. "Policy Components of Arms Competition." *American Journal of Political Science* 27: 385-406.

Mearsheimer, John J. 2001. *The Tragedy of Great Power Politics*. New York: Norton.

Moll, Kendall D. and Gregory M. Luebbert. 1980. "Arms Race and Military Expenditure Models: A Review." *The Journal of Conflict Resolution* 24: 153-185

Morgenthau, Hans J. 1948. *Politics Among Nations*. New York: Knopf.

Morrow, James D. 1989. "A Twist of Truth: A Re-Examination of the Effects of Arms Races on the Occurrence of War." *Journal of Conflict Resolution* 33: 500-529.

Most, Benjamin A. and Harvey Starr. 1980. "Diffusion, Reinforcement, Geopolitics, and the Spread of War." *American Political Science Review* 74:932-46.

Mullins, A. F. 1987. *Born Arming: Developments and Military Power in New States.* Stanford: Stanford University Press.

News 24. 2004. *SA Must Stop 'Arms Race' – DA.* July 17, 2009, from http://www.news24.com/News24/South_Africa/Politics/0,,2-7-12_1543015,00.html

Oneal, John R. and Bruce Russett. 1997. "The Classical Liberals Were Right: Democracy, Interdependence, and Conflict, 1950-1985." *International Studies Quarterly* 41: 267-294.

Oneal, John R. and Bruce Russett. 2005. "Rule of Three, Let It Be? When More Really Is Better." *Conflict Management and Peace Science* 22:293-310.

Palmer, Glenn and T. Clifton Morgan. 2006. *A Theory of Foreign Policy.* Princeton: Princeton University Press.

Peterson, Jane. 1998. "The Natufian Hunting Conundrum: Spears, Atlatls, or Bows? Musculoskeletal and Armature Evidence." *International Journal of Osteoarchaeology* 8:378-389.

Poole, Keith T. and Howard Rosenthal. 1997. *Congress: A Political-Economic History of Roll Call Voting.* New York: Oxford University Press.

Ray, James Lee. 2003. "Explaining Interstate Conflict and War: What Should Be Controlled For?" *Conflict Management and Peace Science* 20: 1-32.

Reed, William. 2000. "A Unified Statistical Model of Conflict Onset and Escalation." *American Journal of Political Science* 44: 84-93

Reed, William, David H. Clark, Timothy Nordstrom and Wonjae Hwang. 2008. "War, Power, and Bargaining." *Journal of Politics* 70:1203-16.

Reuters. 2007. *U.N. Court Hears Nicaragua Honduras Border Row Case.* July 22, 2009, from http://uk.reuters.com/article/idUKL0521210220070305?pageNumber=2&virtualBrandChannel=0

Richardson, Lewis F. 1960. *Arms and Insecurity*. Pacific Grove, CA: Boxwood.

Rider, Toby J. 2009. "Understanding Arms Race Onset: Rivalry, Threat, and Territorial Competition." *Journal of Politics* 71: 693-703.

Romero, Simon. 2006. *Bolivia Reaches For A Slice of the Coast That Got Away.* July 2, 2008, from http://www.nytimes.com/2006/09/24/world/americas/24bolivia.html?_r=2

Romero, Simon. 2008. *Regional Bloc Criticizes Colombia Raid In Ecuador.* July 2, 2008, from http://www.nytimes.com/2008/03/06/world/americas/06venez.html

Sample, Susan G. 1996. *Arms Races and the Escalation of Disputes to War*. PhD dissertation. Nashville, TN: Vanderbilt University.

Sample, Susan. 1997. "Arms Races and Dispute Escalation: Resolving the Debate." *Journal of Peace Research* 34:7-22.

Sample, Susan. 1998a. "Military Buildups, War, and Realpolitik: A Multivariate Model." *Journal of Conflict Resolution* 42:156-75.

Sample, Susan. 1998b. "Furthering the Investigation into the Effects of Arms Buildups." *Journal of Peace Research* 35:122-6.

Sample, Susan. 2002. "The Outcomes of Military Buildups: Minor States vs. Major Powers." *Journal of Peace Research* 39: 669-91.

Sarkees, Meredith Reid. 2000. "The Correlates of War Data on War: An Update to 1997." *Conflict Management and Peace Science* 18: 123-144.

Sartori, Anne E. 2005. *Deterrence by Diplomacy.* Princeton: Princeton University Press.

Sciolino, Elaine. 1987. *White House to Push Sale of Jets to Honduras.* July 22, 2009, from http://www.nytimes.com/1987/05/12/world/white-house-to-push-sale-of-jets-to-honduras.html?scp=3&sq=honduras%20jets&st=cse

Schelling, Thomas C. and Morton H. Halperin. 1961. *Strategy and Arms Control.* Potomac Books

Senese, Paul D. and John A. Vasquez. 2005. "Assessing the Steps to War." *British Journal of Political Science* 35: 607-633.

Senese, Paul D. and John A. Vasquez. 2008. *The Steps to War.* Princeton: Princeton University Press.

Shchedrov, Oleg. 2007. *U.S. "Imperialism" Means New Arms Race: Putin.* July 30, 2008, from http://www.reuters.com/article/topNews/idUSL3147787120070531

Shea, John J. 2001. "The Middle Paleolithic: Early Modern Humans and Neandertals in the Levant." *Near Eastern Archaeology* 64: 38-64.

Shea, John J. 2007. The Boulevard of Broken Dreams: Evolutionary Discontinuity in the Late Pleistocene Levant. In *Rethinking the Human Revolution*, eds. P. Mellars, C. Stringer, O. Bar-Yosef and K. Boyle. Cambridge, UK: McDonald Institute for Archaeological Research Monographs pp. 219-232.

Shetty, Raksha. 2005. *Iran Arms Stockpile Worries U.S.* July 2, 2008, from http://www.cbsnews.com/stories/2005/03/25/world/main683285.shtml

Singer, J. David and Melvin Small. 1972. *The Wages of War, 1816-1965.* New York: John Wiley.

Small, Melvin, and J. David Singer. 1982. *Resort to Arms: International and Civil Wars, 1816-1980.* Beverly Hills, CA: Sage Publications.

Stiner, M. C. 1993. "Modern Human Origins: Faunal Perspectives." *Annual Review of Anthropology* 22: 35-82.

Stoll, Richard J. 1982. "Let the Researcher Beware: The Use of the Richardson Equations to Estimate the Parameters of A Dyadic Arms Acquisition Process." *American Journal Of Political Science* 26: 77-89.

Stoll, Richard J. 2006. "In Harms Way? Naval Arms Competitions, 1816-2001." Paper prepared for the Annual North American Meeting of the Peace Science Society (International), Columbus, OH.

Tertrais, Bruno. 2001. "Do Arms Races Matter?" *The Washington Quarterly* 24: 123-133.

Thompson, William R. 2001. "Identifying Rivals and Rivalries in World Politics." *International Studies Quarterly* 45:557-86.

Turner, John W. 1998. *Continent Ablaze: The Insurgency Wars in Africa 1960 to the Present.* London: Arms and Armour Press.

The United Nations. 2006. *Reports of International Arbitral Awards: Dispute Between Argentina and Chile Concerning the Beagle Channel.* April 20, 2009, from http://untreaty.un.org/cod/riaa/cases/vol_XXI/53-264.pdf

United Press International. 2009. *Peru Seeks Non-Aggression Treaty To Halt S. America Arms Race*. November 13, 2009, from http://www.upi.com/Business_News/Security-Industry/2009/09/30/Peru-seeks-non-aggression-treaty-to-halt-S-America-arms-race/UPI-37861254346320/

Valeriano, Brandon G. 2003. *The Steps to Rivalry: Power Politics and Rivalry Formation.* PhD dissertation. Nashville, TN: Vanderbilt University.

Valeriano, Brandon. 2009. "The Tragedy of Offensive Realism: Testing Aggressive Power Politics Models." *International Interactions* 35: 179-206.

Vasquez, John A. 1983. *The Power of Power Politics: A Critique*. New Brunswick, N.J.: Rutgers University Press.

Vasquez, John A. 1993. *The War Puzzle*. Cambridge: Cambridge University Press.

Vasquez, John A. 1995. "Why Do Neighbors Fight? Proximity, Interaction, or Territoriality." *Journal of Peace Research* 32: 277-293.

Vasquez, John A. 1996. "Distinguishing Rivals That Go To War From Those That Do Not: A Quantitative Comparative Case Study of the Two Paths to War." *International Studies Quarterly* 40: 531-558.

Vasquez, John A. 1998. *The Power of Power Politics: From Classical Realism to Neotraditionalism*. Cambridge: Cambridge University Press.

Vasquez, John A. 2000. What Do We Know About War? In *What Do We Know About War,* ed. John A. Vasquez. Lanham, Maryland: Rowman and Littlefield.

Vasquez, John A. and Brandon Valeriano. 2010. "Classification of Interstate War." *Journal of Politics* (Forthcoming).

Vines, Alex. 1996. *Of Arms and Islands: The Botswana Namibia Cold War.* July 2, 2008, from http://www.africafiles.org/article.asp?ID=3862

Voeten, Erik. 2000. "Clashes in the Assembly." *International Organization* 54: 185-215.

Voeten, Erik. 2004. "Resisting the Lonely Superpower: Responses of States in the UN to U.S. Dominance." *The Journal of Politics* 66: 729-754.

Voeten, Erik and Adis Merdzanovic. 2009. *United Nations General Assembly Voting Data*. July 15, 2009, from hdl:1902.1/12379

Wallace, Michael D. 1979. "Arms Races and Escalation: Some New Evidence." *Journal of Conflict Resolution* 23: 3-16.

Wallerstein, Immanuel. 1979. *The Capitalist World Economy.* Cambridge: Cambridge University Press.

Walter, Matthew. 2008. *Chavez Goes Shopping in Russia Amid Arms Race.* July 22, 2009, from http://www.bloomberg.com/apps/news?pid=20601109&sid=aciomXiknWY0

Ward, Michael D. 1984. "Differential Paths to Parity: A Study of the Contemporary Arms Race." *American Political Science Review* 78:297–317.

Weede, Erich. 1980. "Arms Races and Escalation: Some Persisting Doubts." *Journal of Conflict Resolution* 24:285-87.

Werner, Suzanne. 1999. "The Precarious Nature of Peace: Resolving the Issues, Enforcing the Settlement, and Renegotiating the Terms." *American Journal of Political Science* 43: 912-934.

Wrangham, Richard W. 1999. "Evolution of Coalitionary Killing." *Yearbook of Physical Anthropology* 42: 1-30.

Zibechi, Raul. 2007. *Chile and Venezuela: Myths and Realities of the Arms Race.* July 2, 2008, from http://americas.irc-online.org/am/4416